THE IRON AGE

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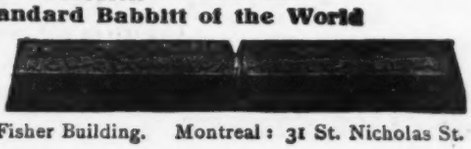

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THE IRON AGE

New York, Thursday, July 30, 1908.

The Milwaukee High Power Miller.

In the Milwaukee No. 3-B universal milling machine, the Kearney & Trecker Company, Milwaukee, Wis., has made a number of striking departures from usual practice. The machine is of constant-speed drive, high-power type, designed, as the latter designation implies, to take heavy cuts at fast feeds beyond the limit of work ordinarily put upon a knee-type miller. That the machine is intended for heavy work is readily apparent from the illustrations herewith. The lines as a whole suggest it, and examination into the details of any of its parts bears out the impression, strength being found where strength will be needed, ample bearing surfaces for all sliding and revolving parts and a general stockiness at all places where unfavorable leverages exist when the machine is heavily loaded.

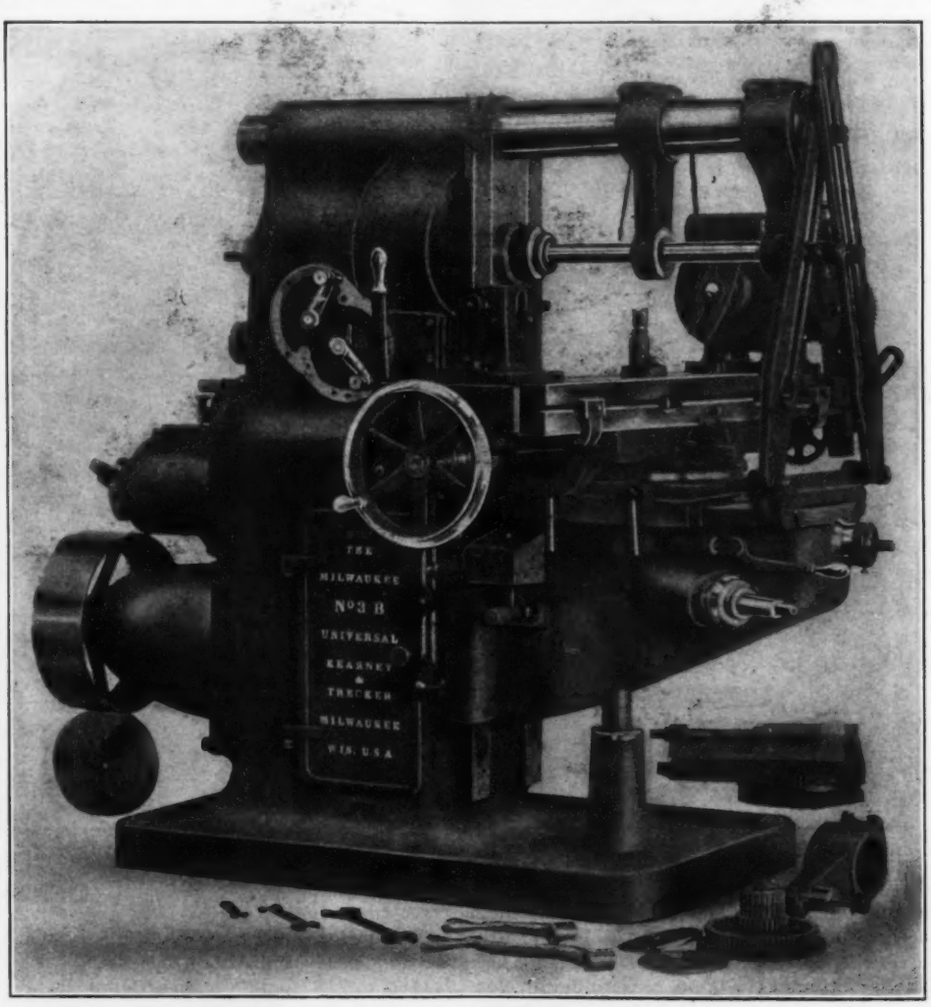


Fig. 1.—The Milwaukee No. 3-B Universal Miller, Built by the Kearney & Trecker Company, Milwaukee, Wis.

As the most prominent features, the drive, lubrication and the new universal dividing head might be mentioned, but there are many original points in connection with the various details, all of which are interesting. The drive of the spindle and the feeds is positive throughout; there are no belt transmissions on the machine, not even for the oil pumps. All gears are under cover; nearly all of those concerned in the various transmissions are entirely within the column of the machine. The feeds being driven from the constant speed driving shaft are independent of the speed of the spindle, hence it is possible to rate them in inches per minute—*i. e.*, terms of time which is a fixed standard. This is in contrast to the custom of rating the feeds in inches per revolution of the spindle which is based on a variable standard of comparison. The new arrangement has the advantages that the feed is known at once without reducing it to a time basis according to the spindle speed, being read directly on the index plate, and that fast feeds for large cutters can be had, however slowly the spindle may be running. Lubrication is one of the things that has received an unusual amount of attention and probably no machine of its class was ever more thoroughly provided with automatic oiling arrangements. These include not only those for the various running parts, but also the cutter and work. The universal dividing head has been modified in ways that conduce to greater accuracy, rigidity, convenience and versatility. All controlling levers are at a convenient hight from the floor and within easy reach of the operator at all times.

The General Design.

The views of the two opposite sides of the machine, Figs. 1 and 2, are evidences of its neat and nearly symmetrical exterior. It will be noticed that the frame has no unclosed openings and is therefore substantially of continuous box section. As viewed in Fig. 2, only one opening is seen in the frame. This is in an extension at the base and gives access to the oil reservoir holding the lubricant for the gears and bearings of the machine. Rais-

ing the cover of this reservoir permits replenishing the supply. The opening covered by the door, shown in Fig. 1, has a wall on both sides, so that it is virtually a double box section tied together by the back wall. The opening is smaller than the door would indicate, as a wall behind it extends up nearly to the level of the door knob, forming one side of a reservoir for the lubricant used on the milling cutters. The opening at the top of the frame, Fig. 1, through which the gears and other parts are reached, is covered by a plate shown removed in Fig. 3. The other functions of this plate are described later in connection with the speed change mechanism. Fig. 4, a rear view of the machine, makes clear the way in which the feed box and pulley bracket are attached, each of these necessitating an opening in the frame through which a shaft extends carrying a gear engaging with the mechanism in the interior.

The Spindle Drive.

The advantages of driving from a single pulley with relatively high constant speed are now quite generally

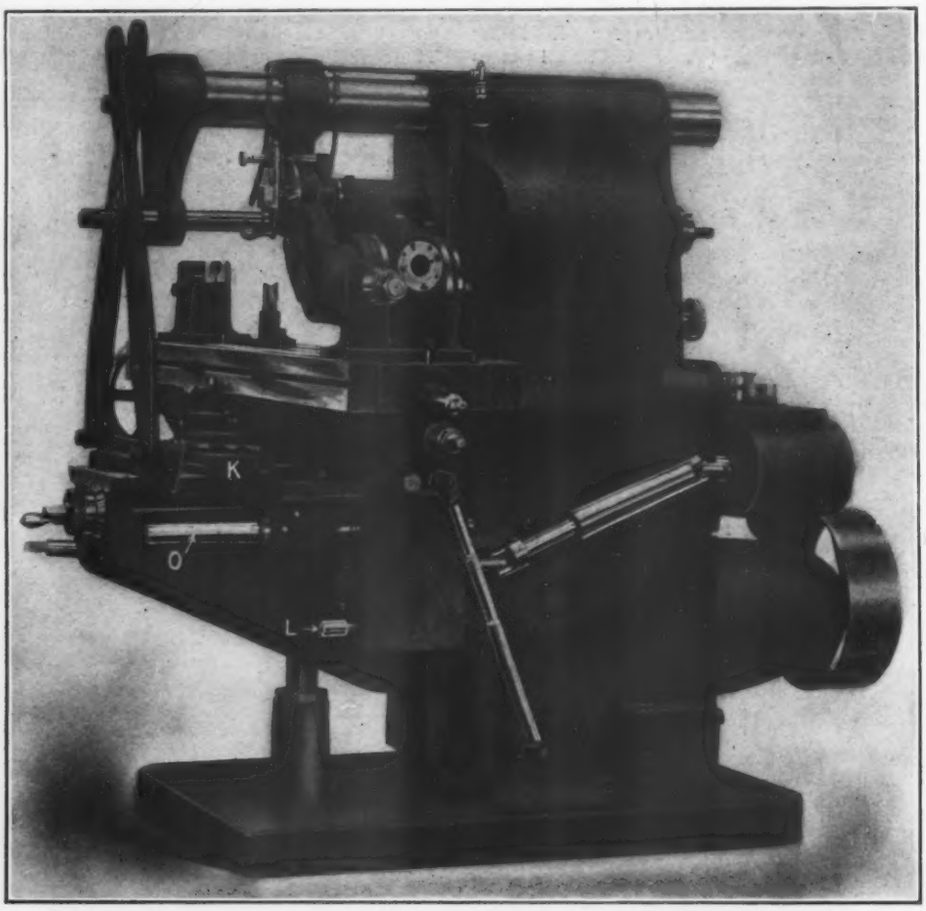


Fig. 2.—A View of the Opposite Side of the New No. 3-B Milwaukee Universal Milling Machine.

appreciated, among them being higher power and elimination of the need of a countershaft. The company's experience from commercial practice and its own tests has resulted in its discontinuing to build cone pulley driven milling machines for either manufacturing or toolroom work. In the present machine the pulley, running at about 350 rev. per min., drives a shaft that has a pinion on its inner end, engaging with a larger gear, giving a speed reduction of about 3½ to 1. This larger gear runs loosely on a shaft upon which it is free to move endwise and has a hardened steel clutch attached to one side of it. On this same shaft is another gear of the same size also carrying a clutch that meshes with a gear directly above it and on the shaft B, Fig. 4. This gear drives the feed and also meshes with the pinion *a*, shown in the line drawing, Fig. 5, which is located approximately at C in Fig. 4.

The first large gear mentioned, the one engaged with the pinion on the pulley shaft, is moved by the lever D, Fig. 4, to engage or disengage the clutches referred to, thus starting and stopping the machine without using friction clutches. This is possible because these clutches revolve at a constant speed which is low enough not to produce excessive shock, regardless of what speed the spindle may be set for. The pinion *a*, Fig. 5, drives shaft *b*, to which is keyed the pinion *c*. This in turn drives the idler gear *d*, which is carried by a swinging bracket, *e*, having gear teeth, *f*, cut in it so that it may be manipulated by a long pinion on the shaft with the controlling handle E, Fig. 4. For convenience this segment, *e*, is shown in Fig. 5, dropped down farther than it actually goes, as it swings in such a way that the pinion *d* engages with the various steps of the cone gear *g*. The endwise location of the swinging bracket *e* is controlled by the handle F, Fig. 3. This handle through a gear and rack, as shown in the rear view of the plate given in Fig. 3, operates the extension G engaging with the slot *h*, Fig. 5, of the swinging bracket *e*.

The speed plate under the hub of the handle F indicates 18 speeds, varying by increments of approximately 20 per cent. from 13 to 320 rev. per min. Attached to and revolving with the cone of gears *g* of Fig. 5 is the pinion *i*, which engages with the gear *j*. This gear revolves idly on the spindle and carries the pin *k*. The sleeve gear *l*, keyed to the spindle *q*, has two gears, *m* and *n*, which may be engaged respectively with gears *o* and *p* on the cone *g*, or the sleeve may be moved to the right, bringing *n* out of engagement with *p* and engaging the gear *m* with the pin *k*; thus three speeds are obtained, which multiplied by the six speeds obtained by the cone *g* and the idler *d* gives 18 speeds in all. It will be seen that the only gears in mesh at any one time are those actually driving; no idle gears are engaged. The gears are of large dimensions and all are made of steel.

The speed plate is arranged with three concentric rows of figures indicating these speeds. The inner one corresponds to the slowest, and these speeds are obtained when handle H, Fig. 3, is at its upper right position. The medium speeds are obtained when this handle is at its lower left position and the fastest when it is at the point midway. Through a gear and rack the handle H operates the extension I engaging with the groove *k*,

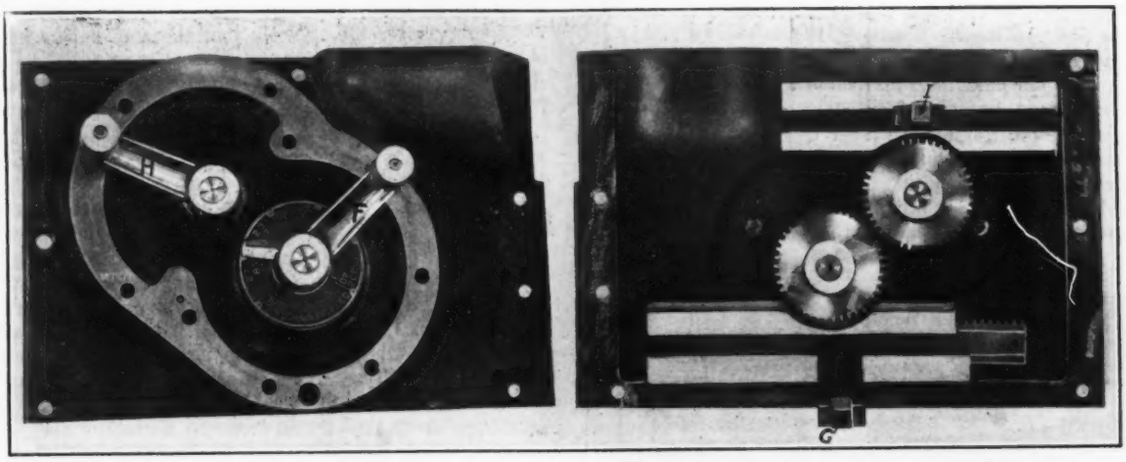


Fig. 3.—Front and Back Views of the Plate Carrying the Spindle Speed Controlling Levers.

Fig. 5, on the sleeve *l*, so that it can be set with ease to any one of the three positions which correspond to those indicated by the three holes on the speed plate marked "Slow," "Medium" and "Fast." Nothing could be simpler than this direct reading index dial. Unlike a separate index plate that shows by symbols what must be done with the various gear changing levers, this one reads directly. The proper thing to do to get the required speed is obvious and as easy as the setting of an alarm clock. It is always apparent what speed the machine is set for, and one does not have to consult a key to find out what condition it was left in by the last user.

In making speed changes, if the gears are not in proper relation to mesh, a touch on the hand wheel *s*, Fig. 5, will turn the spindle and slightly move the gears so as to bring them into engagement. It will be noticed that the spindle runs in taper bearings, the wear being taken up by the sliding of the cone shaped bearing *t*, which is accomplished by the collar *u* threaded to the spindle and clamped thereon by the screw *v*.

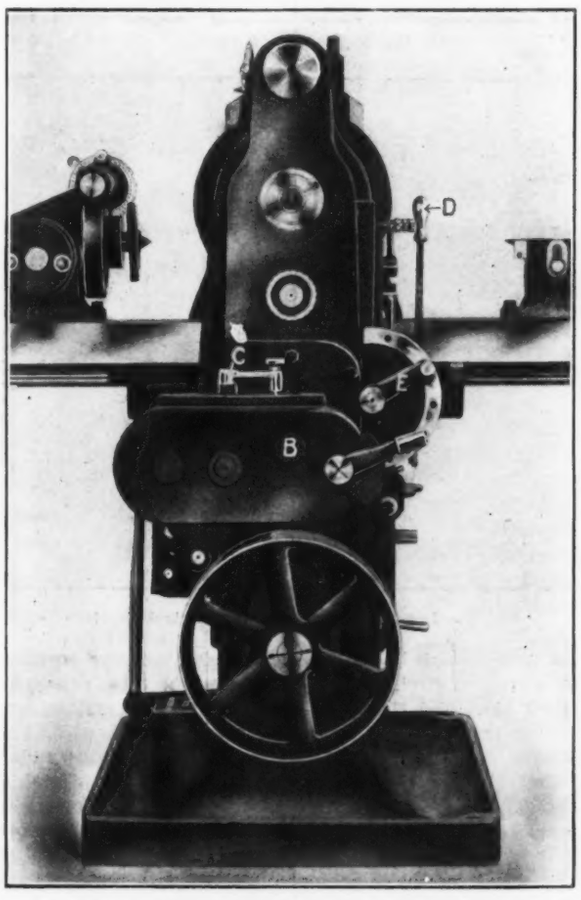


Fig. 4.—A Front View of the Machine, Showing Its Symmetrical Design.

The Feeding Mechanism.

The feed is driven from the constant speed shaft B, shown in Fig. 4, through gearing quite similar to that shown by the line drawing for the spindle drive. The index plate, as before mentioned, shows the rates of feed in inches per minute rather than in thousandths of inches per turn of the spindle. Twelve changes of feed are afforded, varying from ½ to 16 in. per minute, or from about 0.0015 in. per turn of the spindle for small cutters to a little over 1 in. per turn for finishing cuts with large cutters. From the feed box power is transmitted through the universal joint shaft at the side of

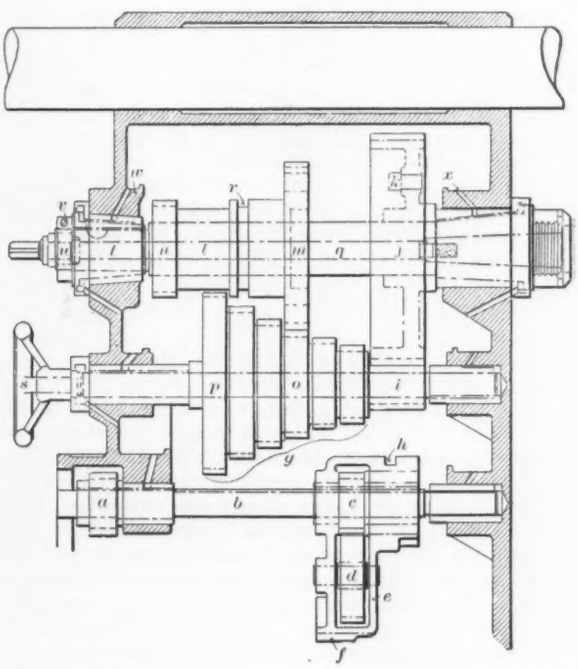


Fig. 5.—Elevation of the Driving Gears Inside of the Column.

the machine shown in Fig. 2 direct to the knee, where a spur gear reverse is provided, operated by the handle L. This handle slides a clutch between two gears running in opposite directions.

A unique arrangement is made to prevent accidental engagement of more than one at a time of the three feeds—vertical, table and cross feed—and also to make it clear to the operator which feed he is about to use without experiment. For each of these three feeds there is a hole drilled in the side of the knee and stamped below are the words "Vertical," "Table" and "Cross." The location of the plunger M determines which of these feeds will be engaged when the operator starts the machine. The feed operating handles are shown in Fig. 6 in better detail than in Fig. 1. The plunger M as shown in this view, is set for the vertical feed. The lever N is connected by a cross shaft to a clutch on the shaft O, Fig. 2, and in the position for cross or vertical feed this clutch

is withdrawn, so that the table feed becomes inoperative. In the position shown, handle P, Fig. 6, can be raised up, which engages a clutch to start the vertical feed. A downward movement of this same handle would engage the cross feed, but is prevented by the lever Q striking against the plunger M, the lever Q being connected with the handle P. In a similar manner engagement with the vertical feed is prevented when the plunger is set in the opposite hole marked "Cross." When the plunger is in a central position it passes through the lever Q and locks it against movement in either direction, so that

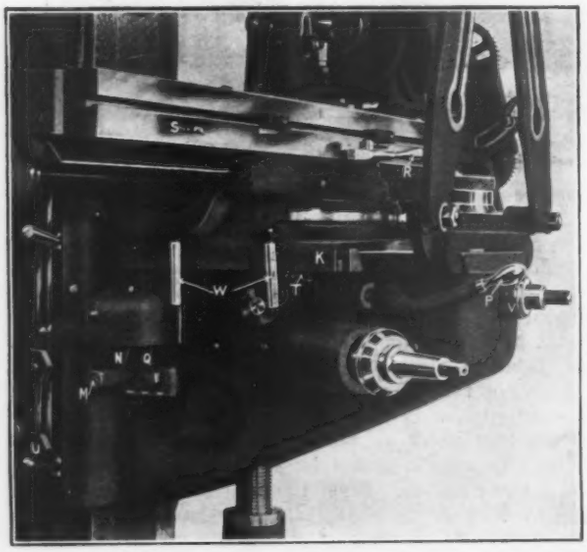


Fig. 6.—Detail of the Knee Showing the Feed Operating Handles.

neither cross nor vertical feed can be engaged, and in this position the clutch on shaft O comes into engagement with the driving gear in the knee, making the table feed operative when it is engaged by the handle R. Adjustable trip blocks are provided to trip the feed at any desired point, and fixed trips are provided at the end of the stroke of all the feeds—S for the table feed, T for the cross feed and U for the vertical feed. The other end of each stroke is similarly protected. The vertical feed screw is of telescopic pattern and never projects below the base of the machine, so that no hole is required in the floor.

On all feed screws there are ball bearing thrust collars; the one for the cross feed is shown at V in Fig. 6. A second ball bearing on this same screw inside of the knee takes the thrust in the opposite direction. The handles W are used to clamp the saddle K to the knee. To prevent the knee from becoming distorted on account of this clamping, or from strains produced by the action of the cutters on the work, it is cast without a hole through the top, this being a continuation of the company's practice begun with the first cone pulley machine it built. This feature is regarded as a very important one in the knee type machine, as it not only renders the machine more rigid and less liable to distortion under strain, but also permits greater cross range and consequently wider tables on universal machines. With short cross range the width of the table back of the center of the swivel carriage is limited by the reason of the fact that the table would strike the edge of the frame before it could be swiveled to the usual 45 degrees. This machine has a table 14 in. wide, having 12 in. of cross range, and it can be swiveled to an angle of 52 degrees, utilizing the full table travel. It can also be swiveled through 360 degrees, and the table feed remains operative at any angle.

The arm braces are made so that they can be removed from the machine without taking off any nuts. They are very simple in construction and their efficiency as braces is much enhanced by an upper bolt which ties the two braces together near their tops and emphasizes their truss action.

Lubrication.

Connected with the large gear, driven by the pulley shaft pinion, is a pump of simple construction, consisting of two spur gears running together in a suitable case. This pump raises the oil from the reservoir, shown at the base in Fig. 2, to a perforated pipe at the top of the machine above the gears on the spindle *q*, Fig. 5. Through the numerous openings in this pipe oil is delivered into the pockets *w* and *x* and to the gears between these bearings. This oil is passed downward by the gears from one to the other, the shafts being located approximately in a vertical plane. From the pockets *w* and *x* it overflows and cascades to the various pockets and bearings beneath in continuous streams. A portion of this cascading oil finds its way into the feed box, lubricating all of its shafts and gears, and another part flows in a continuous stream through the pulley bracket, thence to the bearing next to the pulley. It will be noticed that the pulley arms are curved outward, so as to bring this outside bearing as nearly as possible in direct line with the belt pull. The oil finally drains from the bottom of the pulley bracket to the reservoir, which extends from one side of the frame to the other, and after straining is redelivered to the discharge pipe by the pump.

The pump for lubricating the cutters is located in the closet of the machine behind the door, Fig. 1, on which the name is cast. This pump runs only when the spindle runs, whereas the other pump for lubricating the gears and bearings runs continuously, so that the pulley shaft is flooded with oil even when the machine spindle is stopped. The pump for lubricating the cutters has a relief and pressure regulating valve for controlling the supply of oil. From this pump the pipe extends upward on the interior of the machine, emerging at a point near the top, as shown in Fig. 2, where a swinging connection is attached, and from thence the pipe connects through stop cocks to two pieces of flexible oil tubing. This is the standard equipment, but it can be varied to suit any special case, and as many of the flexible tubes may be used as are found necessary.

A principal trouble heretofore with flooding oil to the table of a knee type milling machine has been the difficulty of returning it to the reservoir because of inadequate means. The manner in which this has been corrected is indicated in Fig. 7, which shows the table and swivel carriage of the machine. In each end of the table are cast oil pockets partitioned at mid-depth by screens. Connected with the pockets is a channel at the back of

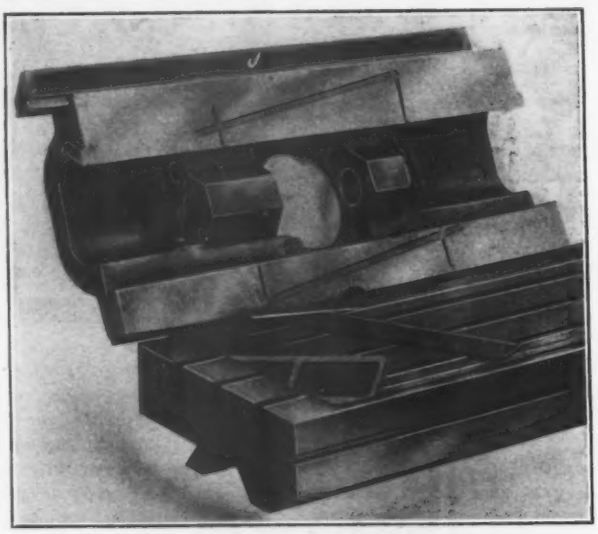


Fig. 7.—Details of the Table and Swivel Carriage.

the table, which is divided horizontally into two sections by a strip of steel. The oil falling on the table runs into the T slots and the front and back grooves and is carried to the ends of the table, where it is strained by the screens and then flows to the center of the table under the strip of steel in the back channel, finally escaping through a hole to the telescoping slide J on the swivel carriage. This slide is used so that the hole in the table will never run beyond the swivel carriage. An opening in the side of the slide communicates with a long opening in the swivel carriage, which terminates in a hole in the bottom of the carriage that registers with a cir-

cular groove in the saddle K, Fig. 2. This circular groove connects through swivel joints with the telescoping tube A, and the oil flows to the reservoir to be again pumped to the cutters. The steel strip shown on the top of the table in Fig. 7 is a blank with which to replace the screen when lubricant is not used, as when milling cast iron, and prevents the dust produced in cutting this material from finding its way into the channels leading down to the reservoir. The depth of the table is a noticeable feature and avoids deflection when the table is heavily loaded and at one extreme of its travel, or put under strain by the clamping of work to it.

The Universal Dividing Head.

Fig. 8 shows an enlarged view of this head, from which it will be seen that the worm wheel is on the front end of the spindle. It is consequently possible to make it much larger in diameter than if it were placed in the interior of the head, where it could be no larger than the opening through which the spindle is introduced endwise, or at most the distance between the housings. This larger diameter is conductive to accuracy, other things being equal, and the placing of the index plate and the plunger directly on the worm shaft avoids inaccuracy that may arise on account of indexing through gearing, which is necessary when the index plate is placed on a secondary shaft. To avoid excessive elevation of the end of the spindle when turned to a vertical position the center line of the spindle is considerably above the axis of the center block, so that the end of the spindle moves downward before reaching the vertical position. Because the worm wheel is large in diameter and substantially made, larger spiral work is possible than could be considered otherwise, and for this reason the driving mechanism and the change gears connecting the worm shaft with the table screw X are made strong enough for heavy work, and the method of carrying the change gears sufficiently rigid to withstand heavy duty. This latter result, it will be appreciated, is accomplished when the swinging bracket Y is used in connection with the semicircular bracket Z bolted to the table.

To facilitate setting the universal head at any angle relative to the spindle of the machine and make it completely universal, it is arranged to interchange with the circular base on the vise, as shown in Fig. 9. The zero line on the head frame corresponds with the zero line on the vise base, and the center block carrying the spindle and worm wheel is also graduated, so that complete universality is obtainable.

This machine has 36 in. of table feed, 12 in. of cross feed and 19 in. of vertical feed. The driving pulley is 16 in. in diameter, takes a 5-in. belt and is intended to run at 350 rev. per min. A motor can be arranged to drive the machine directly by chain or gears to the main driving shaft, and the motor can be mounted, if desired, as a part of the machine. However, the disadvantage of vibration in its effect on the work done by a milling machine makes it preferable, in the opinion of many, to connect by belt to the motor and install the latter at a little distance from the machine or on the ceiling or a column, so that it cannot influence the work nor produce shaky cuts. Any constant speed motor may be used and no special controlling apparatus is necessary, as when using a variable speed motor.

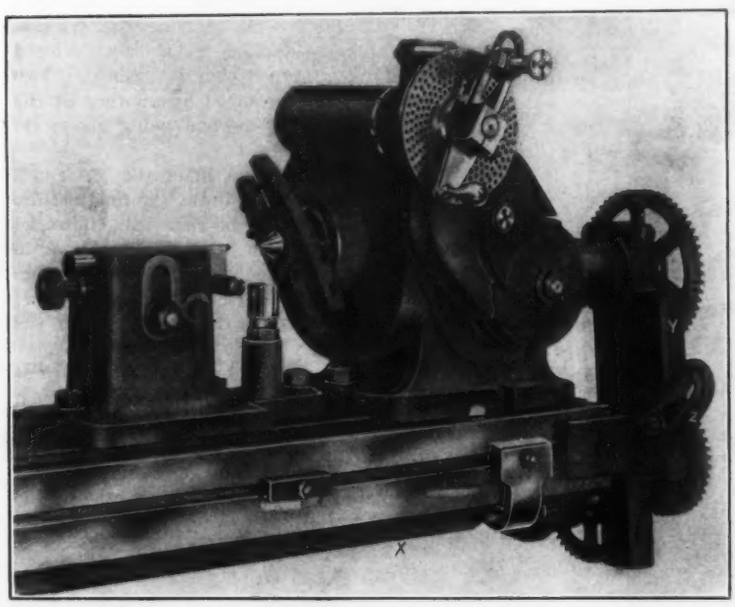


Fig. 8.—The Universal Dividing Head and Tail Center.

Fig. 9.—The Head Mounted on the Vise Base.

The Page Woven Wire Fence Company.—The new 50-ton standard basic open hearth furnace of the Page Woven Wire Fence Company, Monessen, Pa., is now in successful operation, having made several heats. Because of the inadequacy of the cranes now installed, it is necessary to depart from the ordinary practice of casting into a ladle carried by an overhead crane. A 75-ton ladle is carried by a ladle car running over a 12-ft. pit, which extends lengthwise of the mill, and a 25 hp. motor drives the car. The steel is cast through a 3-in. nozzle, filling 38 7 x 9 x 72 in. molds. The stock is brought up an incline to the charging floor level by a dinkey engine and charged into the furnace by a Wellman high type charging machine. By the completion of this furnace the Page Company now has three furnaces in operation, the two others being the Wellman-Seaver tilting furnaces of 15 tons capacity each. The production will aggregate about 50,000 tons a year, which is about the capacity of the connected rod mill, so that the company will not be a buyer of steel in the open market hereafter. In fact, it has been most difficult for it to procure the grades of steel necessary for its specialized manufacture, namely, high carbon material for its fencing and spring steel wire for its wire spring demands. The company reports orders coming in very satisfactorily and all departments running.

The R. Wallace & Sons Mfg. Company, Wallingford, Conn., has been granted the benefit of the drawback on duty paid on steel imported for the manufacture of spoons to be exported. The regulations issued by the Treasury Department state that "in liquidation, the quantity of imported steel which may be taken as the basis for the allowance of drawback may equal the quantity consumed as declared in the drawback entry, provided it shall not exceed 12.96 lb. for each gross of tablespoons, and 6.58 lb. for each gross of teaspoons exported, to which weights may be added 90.78 per cent. in the case of tablespoons, and 81.42 per cent. in the case of teaspoons, to compensate for worthless waste incurred in the process of manufacture."

A New Friction Block for Wire Drawing Frames.

The Carroll friction block for wire drawing frames, shown in detail in the illustrations, has as its essential feature a friction clutch of the coil type, and is designed to meet the requirements of modern wire drawing: That the block should be so driven that it may be brought gradually and smoothly to full speed in order to decrease the shock on the gear teeth, to minimize the breaking of points and make possible an increase in speed; that the operator should be able to start and stop the block with ease even under the most unfavorable conditions, such as with a heavy coil and draft, which means quicker work in handling the block and greater safety in emergencies; and that the top of the block should be kept as low as possible and free from obstructions to facilitate the removal of the heavy coils which are becoming common in modern wire drawing.

To meet these conditions the designer and builder, the Morgan Construction Company, Worcester, Mass., adopted

Fig. 1.—One of the Friction Blocks Mounted on a Rod Frame.

a friction clutch for driving the block, selecting the coil type in preference to all others, and decided to place it within the block itself, on the ground that in this position it would have the least weight to set in motion; that the entire block with its clutch might be removed from its frame without dismantling other parts; and that the clutch could be connected directly to the block. Two other options in clutch location, on the main or bevel pinion shaft in direct connection with the bevel pinion, and on the spindle between the spindle gear and the clutch which drives the block, were rejected after thorough test.

In selecting the coil type of clutch it was borne in mind that its principle is the same as that of the wire block itself, for it is the friction of a few wraps around the drawing block—the others being loose—which pulls the wire through the drawing die. In the clutch it is a few wraps of clutch coil around a center drum which drives the block. Clutches of this type have been used in heavy transmission for years, and in this block the clutch is arranged to operate submerged in oil, so that wear is considered unimportant.

Construction and Operation.

Fig. 1 shows the block mounted on a rod frame, and the details of the block are shown in Fig. 2. A cast iron hub or drum, *a*, with outside surface chilled and ground, is fastened on the spindle, and has an annular recess, *b*, into which projects the concentric flange of the oil cup *c*, a U-shaped annular casting in which the driving mechanism of the clutch rests submerged in oil. The cup is

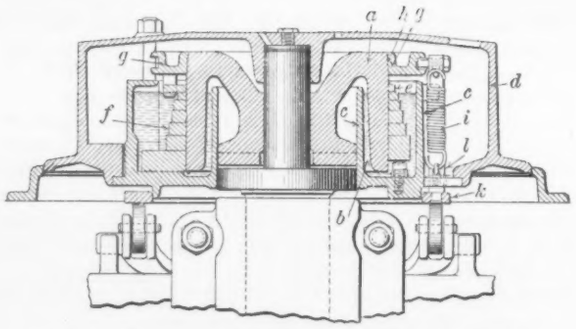


Fig. 2.—Conventional Section of the Friction Block.

fastened to and therefore forms a part of the shell or block proper *d*. Wrapped around the outside of the chilled hub is a soft steel spiral coil, *e*, having its lower end, *f*, fastened to the oil cup and the top or smaller end to the supplementary friction ring *g*, which, when the clutch is set, engages a tapered surface, *h*, on the upper part of the chilled hub. The friction ring is held in contact with the tapered surface of the chilled hub by tension springs, *i*, but is lifted out of contact by the raising of ring *k* carrying standards *l* which engage the ring *g*. The friction block is operated by raising and lowering the friction ring. The entire clutch mechanism is entirely enclosed in the shell, which is so attached that by removing two nuts it may be lifted off and replaced by another of the same or different diameter, the method being shown in Fig. 3.

In the operation of the machine, after the block and clutch have been placed upon the spindle, the foot treadle is adjusted so that the ring *k* may be raised and lowered when the block is ready to start, the spindle being in motion. When the ring *k* and consequently the friction ring *g* are lowered from their raised positions to start the block the friction ring comes in contact with the tapered surface of the chilled hub, and begins to revolve and tighten the small end of the clutch coil to which it is attached. Each wrap of the coil tends to take up a succeeding one, until the friction between the coil and the chilled hub is sufficient to start the block slowly and draw the wire through the die. The operator has only to raise the supplementary friction ring to release the

Fig. 3.—A Friction Block with the Shell Lifted, Showing the Clutch and the Two Retaining Bolts.

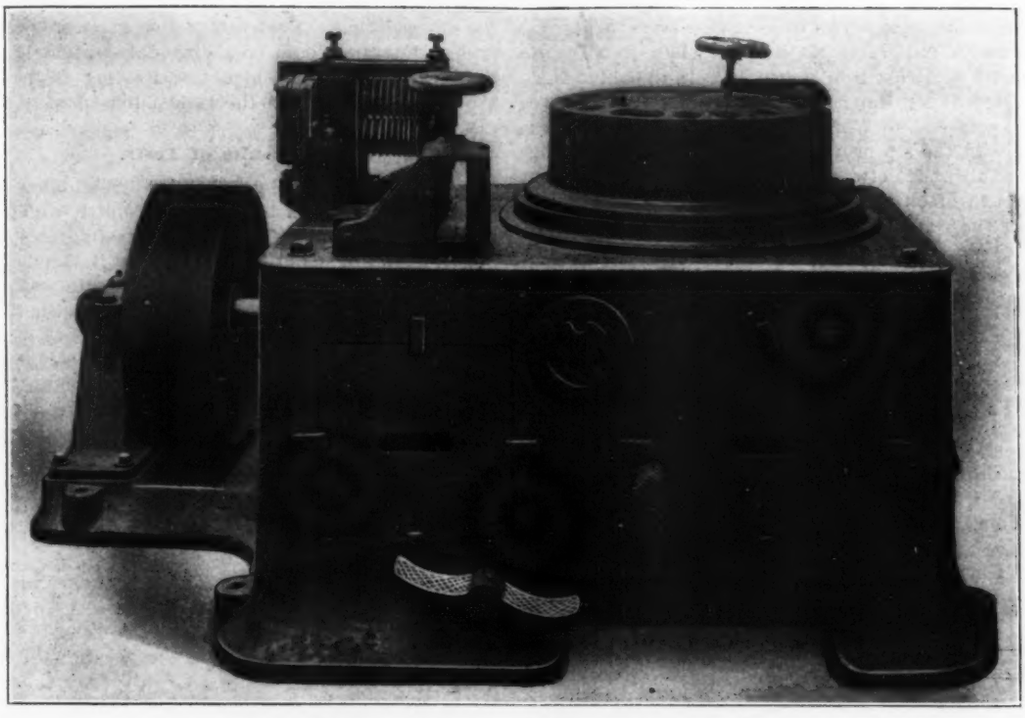


Fig. 4.—One of the Friction Blocks Fitted to a Bull Frame.

clutch coil and stop the block. As the supplementary friction ring is free to revolve in a complete circle it will adjust itself automatically to any variation in the length of the clutch coil due to stretch or wear, and therefore no adjustment is necessary after installation. It will be noticed that the block and clutch mechanism, with the exception of the friction ring, are supported by the block spindle and are not raised or lowered, which is a departure from common practice. Consequently the maximum force required of the operator is that necessary to raise the friction ring against the springs *i*, a force the same whether the block is loaded or empty. In practice a few pounds pressure upon the treadle suffices to start or stop the block under any load.

To demonstrate the power of this clutch the company states that during rigid tests 300 hp. has been transmitted at 100 rev. per min. with the regular clutch used in blocks from 22 to 30 in. in diameter. The clutch is also made to handle blocks from 16 to 22 in. Manufacturing usage in wire mills has shown that it is a practical device for the rough work of wire drawing. One has been operated for two years drawing wire of high carbon steel from 5-16 to ½ in. in diameter, with no adjustments or repairs except the renewal of the steel jaws that grip the end of the rod.

Among the advantages claimed for the block are that only a small mass must be accelerated when starting, minimizing strains throughout the machine; that high speeds may be employed, with consequent high tonnage; that its diameter can be varied by providing spare outer shells, and that the shells, which are subject to the most wear, can be quickly replaced; that it can be applied to almost any frame of the vertical spindle type, either without changes to the existing frame or with very slight changes to the upper end of the block spindles; and that the speed of the block is closely regulated and controlled by the operator, who cannot start up with a shock even if he should attempt to do so.

Tests of the Block.

Fig. 4 shows the friction block fitted to a bull frame. Below are given the results of tests with the new friction block, employing an indicator by which accurate time

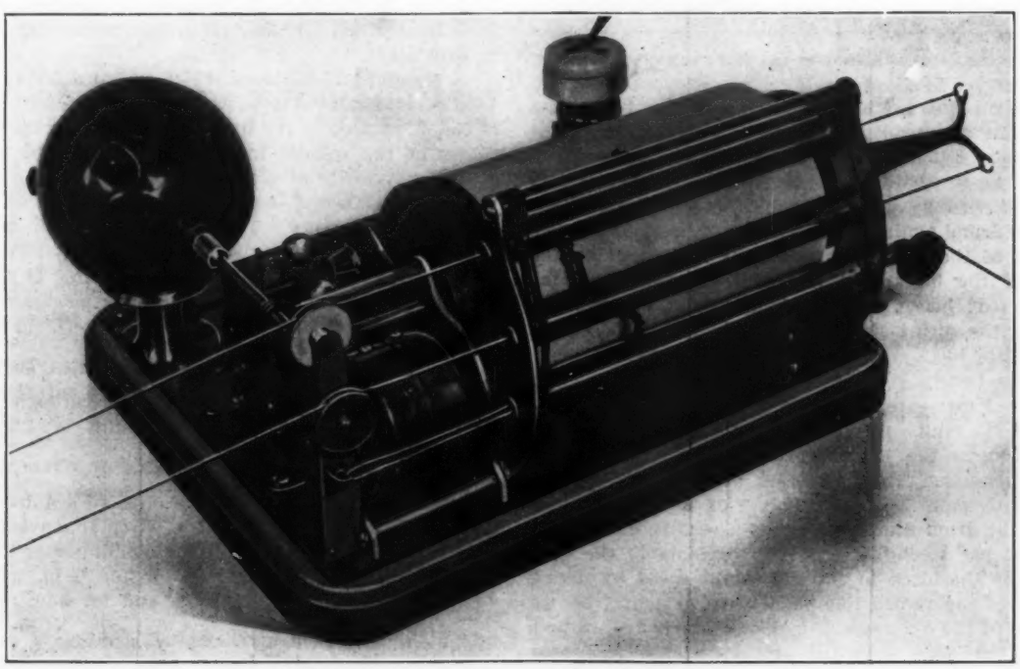


Fig. 5.—The Indicator Used in the Friction Block Experiments.

records could be made. The experiments were made on a Morgan heavy rod frame No. 302, the block spindles of which consist of a cast iron sleeve 5 in. in diameter cast around a steel shaft, this cast iron sleeve having a flange near the lower end to which is bolted the driving gear, and another at the top provided with lugs for driving the block. The distance between these flanges is 1.5 ft. Upon the upper end of one spindle was fitted a friction block, on another the company's standard block, which is fitted with a positive clutch.

The object of the experiments was to determine the length of time required to bring a point upon the surface of the block from rest to full speed when the clutch was thrown in quickly and under the most unfavorable conditions. The time required for starting up either of the blocks is comparatively short, and a mechanism for accurately measuring short intervals of time was absolutely necessary for the success of the experiments. Such a recorder, which was developed in the company's shops, is shown in Fig. 5, and was found to answer the purpose admirably. It consists of a drum carrying a sheet of paper and driven uniformly by a constant speed motor. Extending parallel with the axis of this drum are three slotted tubes carrying points which can be independently connected to any moving piece. When several motions are involved the use of separate pencils is indispensable, but in the present case it was necessary to use only one in testing each block. To this pencil was attached a cord by which it could be pulled along the recording drum against the tension of a spring. The other end of the cord was made fast to a point on the surface of the block and arranged to unwind as the block started; hence, as the whole system was kept in tension by the spring above mentioned, the motion of the surface of the block was accurately recorded by the movement of the pencil.

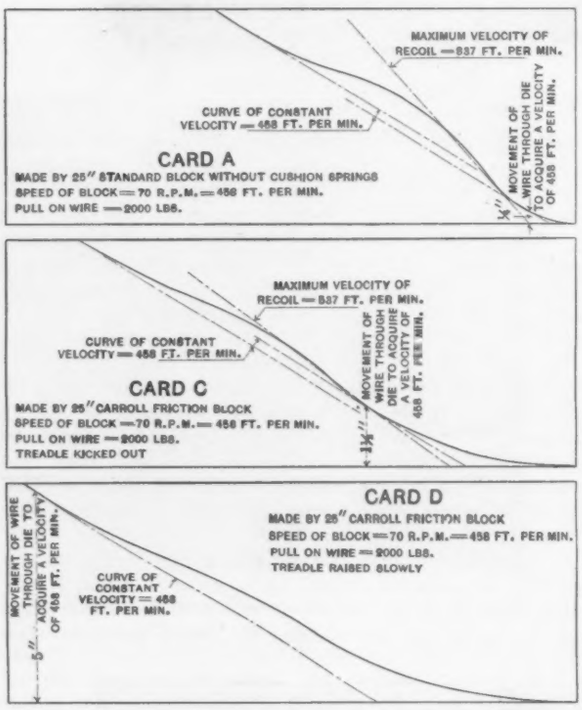

MAXIMUM VELOCITY OF RECOIL = 537 FT. PER MIN.
CURVE OF CONSTANT VELOCITY = 458 FT. PER MIN.
MOVEMENT OF WIRE THROUGH DIE TO ACQUIRE A VELOCITY OF 458 FT. PER MIN.
CARD A
MADE BY 25" STANDARD BLOCK WITHOUT CUSHION SPRINGS
SPEED OF BLOCK = 70 R.P.M. = 458 FT. PER MIN.
PULL ON WIRE = 2000 LBS.
MAXIMUM VELOCITY OF RECOIL = 537 FT. PER MIN.
CURVE OF CONSTANT VELOCITY = 458 FT. PER MIN.
MOVEMENT OF WIRE THROUGH DIE TO ACQUIRE A VELOCITY OF 458 FT. PER MIN.
CARD C
MADE BY 25" CARROLL FRICTION BLOCK
SPEED OF BLOCK = 70 R.P.M. = 458 FT. PER MIN.
PULL ON WIRE = 2000 LBS.
TREADLE KICKED OUT
CARD D
MADE BY 25" CARROLL FRICTION BLOCK
SPEED OF BLOCK = 70 R.P.M. = 458 FT. PER MIN.
PULL ON WIRE = 2000 LBS.
TREADLE RAISED SLOWLY
MOVEMENT OF WIRE THROUGH DIE TO ACQUIRE A VELOCITY OF 458 FT. PER MIN.
CURVE OF CONSTANT VELOCITY = 458 FT. PER MIN.

Fig. 6.—Typical Cards Obtained in the Tests from the Indicator.

When adjustments had been properly made the foot treadle of the clutch was kicked out as quickly as possible, whereupon the block started and the pencil was pulled across the recording drum at the same rate of speed as any point upon the surface of the block. Inasmuch as the drum was revolving at a certain known surface speed per second, it was easy to compute the time required by the block to reach constant speed by noting the slope of the record line, as will be evident from an inspection of the diagrams, Fig. 6. The vertical distances from the base line show the actual distance from rest traversed by a point upon the block, and the horizontal distances measured from any point toward the left give the elapsed time. Evidently a line of constant speed on such a diagram would be a diagonal straight line, and if the actual speed at which the drawing frame spindles are driven is known, a theoretical line of constant speed can be laid out.

Results of Tests.

Card A was made by a standard 25-in. block weighing 355.11 lb. and driven by a positive clutch which allowed no give at starting. The rod fastened to this block required a pull of about 200 lb. to draw it through the die. The block spindle revolved 70 rev. per min., which would equal about 458 ft. per minute drawing speed. This card shows that the circumference of the block acquired a velocity of 458 ft. per minute in a movement of about ¼ in. at the circumference. At this point the block spindle, which had been twisted more in overcoming the inertia of the block in starting than was necessary to keep the block revolving at 70 rev. per min. and drawing the wire, started to recoil like a spring and snapped the wire up to a velocity of 837 ft. per minute, then it settled back to 458 ft. per minute, after which the speed curve is very nearly a straight line.

Card C was made by a Carroll friction block under exactly the same conditions as for card A, including the kicking out of the treadle by the operator to start the block in the least possible time with a clutch of this type. This card shows that it required about six times as long to acquire a speed of 458 ft. as it did with card A. Also, on account of starting more gradually, there was much less torsion, or twist, in the driving shaft, as the maximum speed of recoil was 537 ft. per minute.

Card D was made by a Carroll friction block with exactly the same conditions as card C, except that the foot treadle was raised slowly by the operator instead of being kicked out as for card C. This card shows that the block did not acquire the full speed of 458 ft. per minute until the circumference of the block had moved 5 in., or 20 times as far as in card A; that at no time did the drawing speed of the wire exceed 458 ft. per minute and that there is hardly any recoil of the shaft. Regular operating conditions are much more favorable than those of the test, for the block can be brought up to speed almost at will, and if the length of the indicator roll permitted it would be as easy to trace a card 5 ft. as 5 in. long.

Conclusions.

The constant force required to start a wire block from rest and accelerate its velocity or speed varies directly as the number of revolutions per minute, and inversely as the time or distance through which it acts. For example, if the speed be doubled, then double the force is required; if the time or distance be doubled, half the force is required, all other conditions remaining the same in both cases.

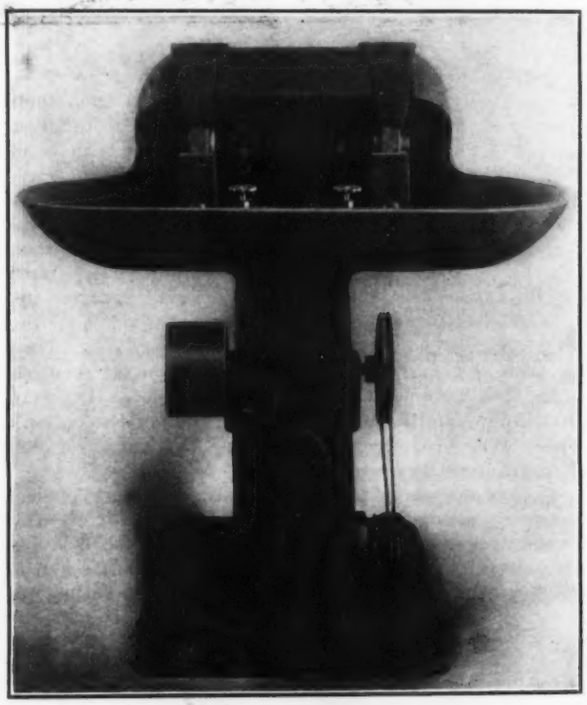
A standard 25-in. block which weighed 355.11 lb. was used in making these tests, and it required a constant force of 535 lb. applied to the lugs at a radius of 6 in. from the center of the spindle to start the block from rest and acquire a velocity of 458 ft. (equal to 70 rev.) per minute in a distance of 1-in. circular movement of a point in the circumference. To start this block in one-fourth the time or distance, as shown in card A, it required a constant force of 4×5035 lb. = 20,140 lb. If the above block acquired full speed in a circular movement at the circumference of 5 in., as shown on card D, the constant force required would equal $\frac{5035}{5} = 1007$ lb. To this add the force required to draw the wire through the die, which was about 2000 lb. at a radius of 12.5 in., or $\frac{12.5 \times 2000}{6} = 4167$ lb. on a 6-in. radius. Then the total constant force applied at 6 in. radius to acquire a speed equal to 70 rev. per min. in 1-in. circular movement of a point in the circumference of a 25-in. diameter block will equal $5035 + 4167 = 9202$ lb., or for ¼-in. movement, $(4 \times 5035) + 4167 = 24{,}307$ lb., and for 5-in. movement at the circumference, as shown by card D, $\frac{5035}{5} + 4167 = 5174$ lb., or about 21 per cent. of the force necessary with the positive type of clutch. It is the large force required

to start the block almost instantly, as shown by card A, which produces the severe strains in a wire drawing machine and is responsible for the excessive wearing and breaking of its parts. The many incidental advantages following from the abolition of this initial shock have already been summed up in detail.

The Gisholt Double Emery Grinder.

Water around a wet emery grinder is generally accepted as a necessary evil, and after a certain amount of precaution has been taken to limit it to an unharmful nuisance it is assumed that the best has been made of a bad situation. The Gisholt Machine Company, Madison, Wis., took a different attitude and in the double grinding machine illustrated, which is one originally designed for use in its own shops, it has effectively removed the objectionable features of using water in connection with an emery grinder.

The measures taken to prevent water from being scattered about the floor are three-fold. The water instead of being discharged on the wheel over the work rest is emitted from a nozzle in the back of the rest and



The New Double Emery Grinder Made by the Gisholt Machine Company, Madison, Wis.

follows around with the wheel, finally meeting the work in a fine spray. An incidental advantage of this is that the work is not obscured by a shower of water. The hood over the wheels incloses them as completely as possible, leaving only a small space on the periphery of each wheel for contact with the work. Practically no water can therefore be thrown by the rapidly revolving wheels, and when doing dry grinding very little emery dust is likely to fly about in the air. Finally a very large water pan is provided so flared on the sides and front that a piece of work 14 in. long comes entirely within the pan so that any drip from it will be caught by the pan, from which it drains into the tank in the base.

Another interesting feature of the machine is the protection of the spindle driving belt. This, as may be seen, is entirely inclosed in the column of the machine. The main driving pulley instead of being directly on the spindle is on a short shaft extending through the column under the pan and on the interior carries the spindle driving pulley and on the opposite end the grooved pulley for driving the water pump. The main belt is not located where exposed to injury from water and emery and the second belt is completely shielded from them as just explained.

The spindle is mounted in adjustable self-oiling boxes, and end play in the spindle is taken up by two adjusting screws in the face of the spindle driving pulley. The spindle carries two 1½-in. face by 14-in. diameter emery wheels. The water is delivered from the ample reservoir to the nozzles through controlling valves by a centrifugal pump in the base belted to the grooved pulley before mentioned. The machine is very heavy and may be supplied with either belt or motor drive.

Repairs to the Niagara Power Tunnel.

On Sunday, July 19, the Niagara Falls Power Company shut down its two generating plants at Niagara Falls, N. Y., to make repairs to the tunnel tailrace that carries the water from the wheelpits to the lower river. A few weeks ago the water was shut out of the tunnel in order that it might be inspected. In both wheelpits and throughout the entire length of the main tunnel between wheelpit No. 1 and the tunnel outlet in the lower river, about 1 1-3 miles, the engineers say that not a brick was replaced and there was no sign of material erosion beyond the rounding of the edges of an occasional brick projecting a fraction of an inch beyond the surrounding surface of the wall. The tunnel has had 13 years of continuous use.

In 1902 an extension of the tunnel to take the discharge from wheelpit No. 2 was completed, and two shafts were constructed for the purpose of discharging the ice from the intake canal directly into the tunnel extension. The recent inspection showed that in two places in this extension the roof had been damaged, presumably by the impact of heavy blocks of ice discharged from the canal through the two shafts. The floor of the tunnel extension beneath each of these shafts is paved with iron blocks, but the projection upward of the heavy pieces of ice with force sufficient to injure the roof structure was not anticipated. In the summer of 1903 a substantial buffer of steel beams was placed just above the tunnel roof at the bottom of the ice shaft at the north end of the canal near power house No. 1. Cakes of ice must now strike upon this buffer and are completely shattered before entering the tunnel. The same construction is possible in the other ice shaft, but has not been placed there because since the winter of 1903-1904 it has been found unnecessary to discharge large cakes of ice through that particular shaft, and such use of the shaft is not expected to be necessary in the future. The appearance of the tunnel extension confirmed the judgment of the engineers that the injuries were done several years ago and that the cause of them no longer exists. The fact that the tunnel extension has been operated continuously for years under present conditions evidently indicates that it might be operated safely for an indefinite further period. A decision, however, has been made by the company to make repairs at once, chiefly because the company's customers are better able during the present month to arrange for such reduction in their power use than they will be later.

While the work is in progress the needs of all local customers will be taken care of by the plant of the Canadian Niagara Power Company. The latter will also supply a share of the long distance load, the remainder of which will be carried by the plant of the Electrical Development Company of Ontario, Ltd.

The Pittsburgh Emery Wheel Company, Pittsburgh, Pa., has been successful in bringing some vitrified emery wheels through on an order in perfect condition with 26 in. in width of face. This is stated by the company to be an extraordinary proposition, as it is not known that any such wheel has been made elsewhere by this process. This is the second order of the kind the company has brought through successfully.

The officers and employees of the Allis-Chalmers Company, Milwaukee, joined in their annual picnic July 25 at Waukesha, Wis. The company has for several years adopted the plan of devoting one day to a picnic for all its employees. President W. H. Whiteside acted as chairman of the general Advisory Committee.

Grinding Disk Tests.

To determine the comparative efficiency for grinding cast iron, with different kinds and makes of abrasive disks, such as are commonly used on disk grinders, the Gardner Machine Company, Beloit, Wis., recently made quite an extensive series of tests. Six different kinds of disks were tested, which as designated in the accompanying table were as follows:

No. 1 a Gardner improved abrasive disk No. 126. Nos. 2, 3 and 4 well known makes of grinding disks, all extensively used and of excellent quality as compared to commercial emery cloth; No. 5, a disk of regular No. 24 commercial emery cloth; and No. 6, the same in emery paper. The disks tested were all 20 in. in diameter and all except Nos. 5 and 6 were of No. 16 grain. The grinding was all done on the same machine by the same operator.

The pieces which were ground were hollow blocks of cast iron as shown in Fig. 1. These blocks were 4 in. long, 3 in. square on the outside and 2 in. square inside, and being ground on the end, the area worked on was 5 sq. in. Reducing the blocks 1 in. in length was therefore equivalent to removing 5 cu. in. of metal. Fig. 2 shows the method of handling the work and twelve

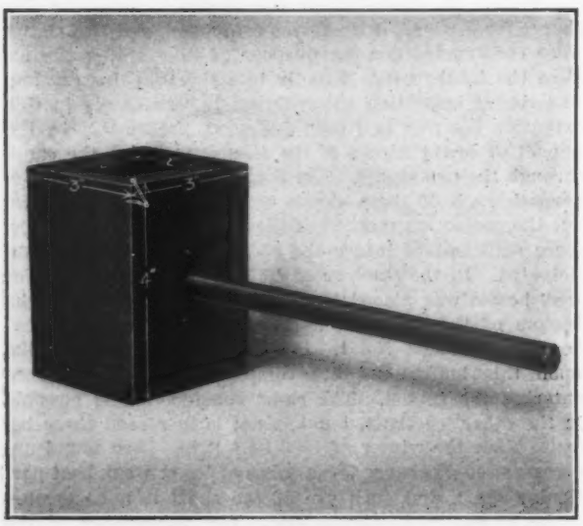


Fig. 1.—One of the Pieces Ground in the Test.

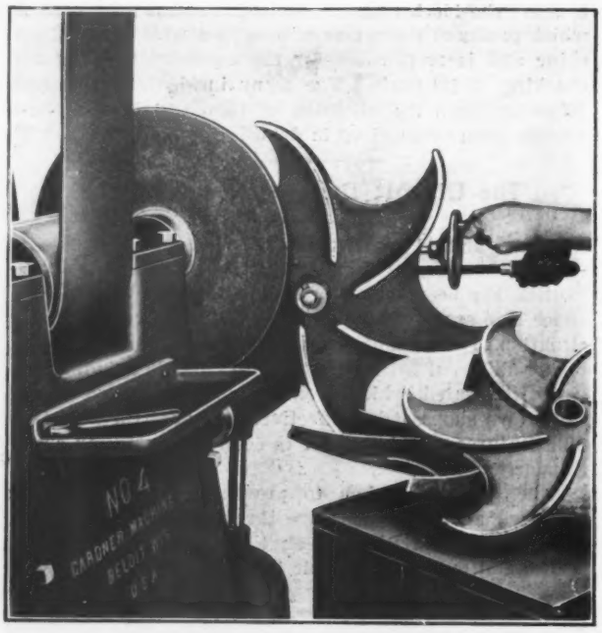


Fig. 3.—Grinding Rotary Pump Impellers.

blocks which have been considerably reduced from their original length. Usually twelve blocks were operated on together. During this test several hundred pounds of these blocks were converted into cast iron chips.

The micrometer stop at the back of the table was set to grind off a fixed amount, usually 0.05 in., and the twelve blocks ground to the stop. The stop was then moved back 0.05 in. and the operation repeated until the disk was worn out or the blocks all ground up, in which case new blocks were substituted and the operation continued until the disk was worn out. Then the time of grinding and the amount of metal removed by the disk were noted. By reversing the blocks they were ground down until the wheel touched the handles on both sides. Whenever the blocks became too warm for efficient grinding they were cooled.

It was necessary to use a Huntington emery wheel dresser on all disks tested except No. 1 and No. 3. The dresser was used whenever the surface of the disk became dull and glazed so that it would not cut cast iron readily. The use of the emery dresser shortens the life

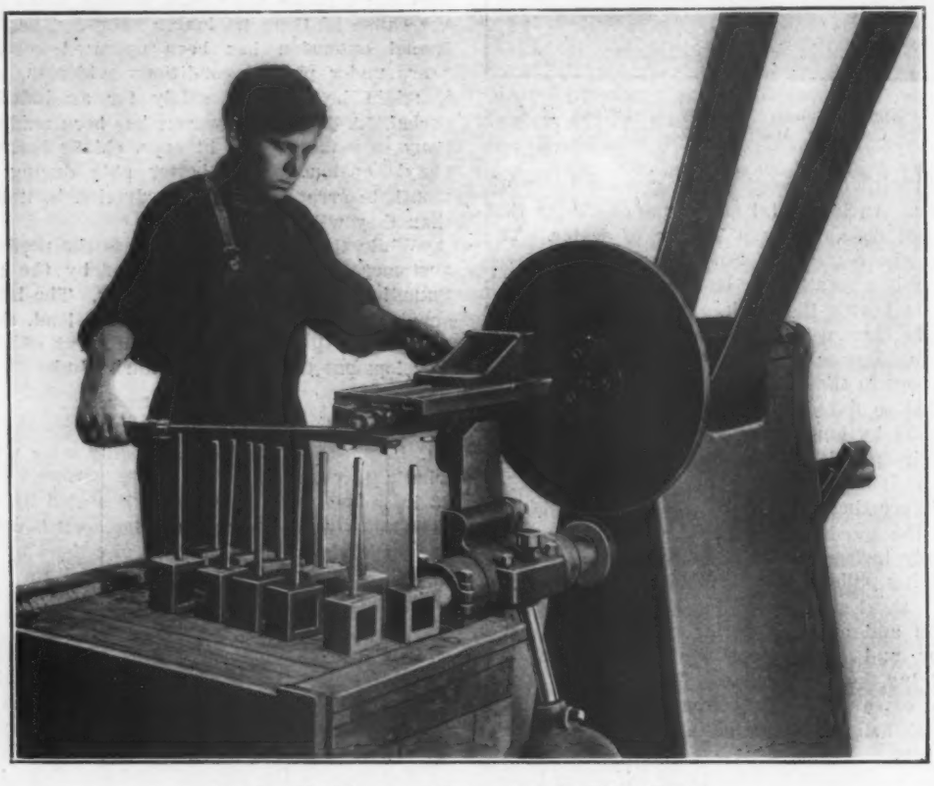


Fig. 2.—The Manner of Testing and the Pieces Tested.

of a disk, but it was absolutely necessary. The results obtained are as per the following table:

Test of the Efficiency of Abrasive Disks.

Disk No.	Time used. Min.	Stock removed Cu. in.	No. of times dres'd.	Average cutting rate. Cu. in. per min.	Cutting rate first half of time used.	Cutting rate second half of time used.	Life of disk based on disk No. 1. Per ct.	Stock removed based on disk No. 1. Per ct.
1	754	349.85	0	0.464	0.442	0.486	100.0	100.0
2	137	42.13	6	0.307	0.344	0.270	18.1	12.4
3	540	113.95	0	0.211	0.238	0.184	71.6	32.3
4	68	27.97	2	0.411	0.546	0.276	9.0	8.0
5	71	2.41	4	0.034	0.062	0.006	9.4	0.7
6	73	12.48	2	0.171	0.273	0.069	9.7	3.5

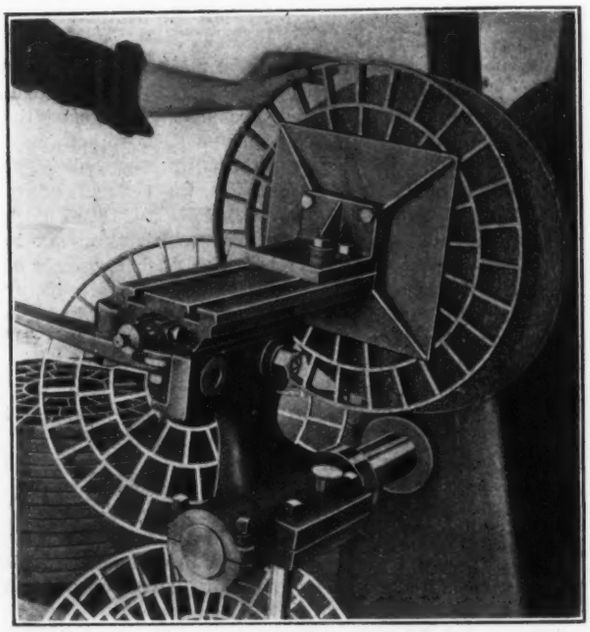


Fig. 4.—Grinding Latticed Plates Used in Making the Disks.

The disk No. 1 in the foregoing table is one made by a new process in which the abrasive grains are mixed with the required bond, cemented to a cloth backing, and while in a plastic condition, mechanically tilted to an efficient cutting angle. Careful examination of a disk treated by the tilting process shows no large grains with large flat faces fixed parallel to the plane of rotation, which is the condition of a great majority of the grains before being subjected to this tilting process. Naturally the flat side of a grain will not cut so freely as a sharp edge, and this is clearly evident from the results given in the table. Another remarkable feature of the No. 1 disk is the uniformity of its cutting efficiency from start to finish. As shown in the table, the disk removed stock even more rapidly the last six hours than it did the first six.

All the other disks tested are made by depositing a heavy coating of glue on the backing sheet and then spreading a quantity of dry abrasive grains on the glue. The abrasive grains settle into the glue and so become firmly attached to the backing sheet. By this process the grains and glue are not evenly mixed from face to back.

Disks made in this way cut freely and rapidly at first but soon wear down to a point where there is too much glue and not enough of the abrasive grains. This is plainly indicated by the record of the disk No. 5 in the columns giving the average cutting speed for the first and second half of the time used.

The accompanying Figs. 3, 4 and 5 show operations on work done with disk No. 1. Fig. 3 shows the grinding of impellers for centrifugal pumps. These were gray iron castings and were very rough and hard in places, making them difficult to machine in a lathe. The diameter is 26 in. and the area of the surface ground is about 50 sq. in. on each side. It was necessary to remove ¼ in. thickness of metal at some points. The rate of grinding these impellers on both sides was 15 min. for each one. The time formerly required for turning them in a lathe was 3½ hr. for each impeller. The pieces are ground at an angle of 7 degrees to the axis, and the surface of the blades being curved and not radial, necessitates their being revolved while grinding. This develops the surface of a cone. The impellers are mounted on a spindle driven through a worm gear and worm by a hand wheel as shown. This fixture is mounted on a lever feed table set at the required angle with the face of the disk wheel, and the impeller is slowly revolved by the hand wheel while the lever is used to bring it against the disk wheel.

Fig. 4 shows a rather interesting job of disk grinding on special cast iron latticed plates. These plates are used in the manufacturing of these special disks and are required to be accurately flat and of uniform thickness. They are 23 in. diameter by ⅞ in. deep. The rings and spokes that go to make up the plates are 5-32 in. thick. The castings being so thin it was found to be impracticable to machine them in a lathe or boring mill, but the results obtained with a disk grinder are entirely satisfactory.

The plates are chucked, at the inner circle, which is about 6 in. in diameter, on a metal disk having set-screw heads projecting from its periphery. This disk has a ¾-in. hole in its center fitting a stud on the angle plate which is bolted to the top of the lower table as shown. The latticed plates are hung on this stud, bearing against the angle plate and are pressed against the disk wheel by the lever. They are free to revolve with the wheel, but the speed of this revolution is easily controlled by changing the relative position of the stud to the axis of the machine spindle, and also by the hand of the operator, as shown. By changing pressure on the lever and by swinging the table on the rocker shaft the revolution of the plates can be increased, stopped entirely, or reversed at will.

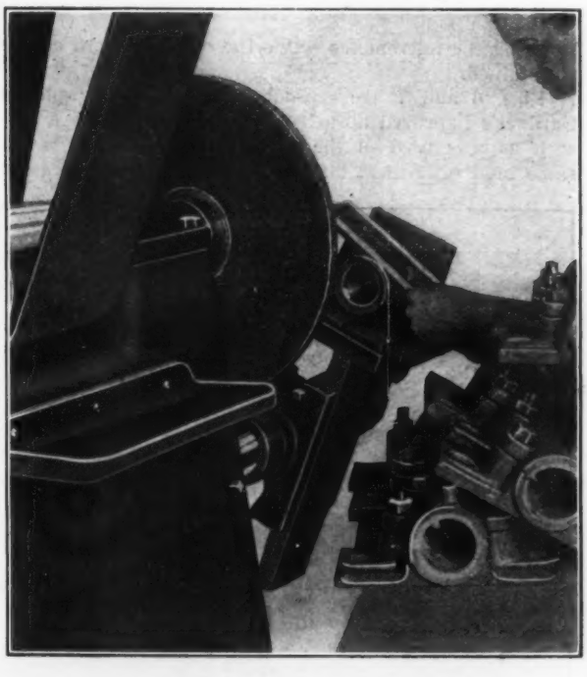


Fig. 5.—Squaring the Ends of Bearing Boxes.

The castings for the plates are made in a stove foundry and are quite accurate to pattern but are too hard to turn. The amount of metal to be removed to make them accurately flat is small, averaging less than 1-32 in. on each side. By the method shown they are finished to required size and made flat on both sides in about 15 min.

Fig. 5 shows the operation of squaring the ends of cast iron boxes after they have been babbitted. In the lot shown, some of the caps lapped over, or fell short of the base as much as ¼ in. and it was necessary to remove more than that thickness on both ends of the box to fully square and face them. The boxes shown are for

2 7-16-in. shaft. The total area of the surface ground on each box was 16 sq. in. Seventy-three boxes were ground on both ends in 59 min., or at the rate of 75 per hr. This work was done with the new disks, but they were coated with a special preparation that prevented the babbitt from clogging the disk. It will be noticed that the boxes are simply slipped on to a freely fitting stud set in an angle plate which is bolted to the top of the lever table. This enables the operator to handle them rapidly, and

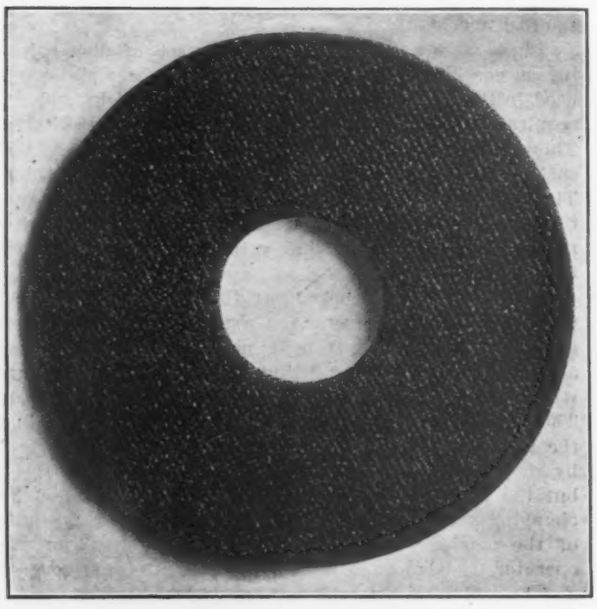


Fig. 6.—Gardner's Improved Abrasive Disk.

by using the micrometer screw the correct length can be maintained.

Figs. 6 and 7 are reproduced from photographs of Gardner's improved abrasive disks. Fig. 6 shows a disk such as was used in the grinding test. Fig. 7 is the same kind of a disk, but made of much finer abrasive,

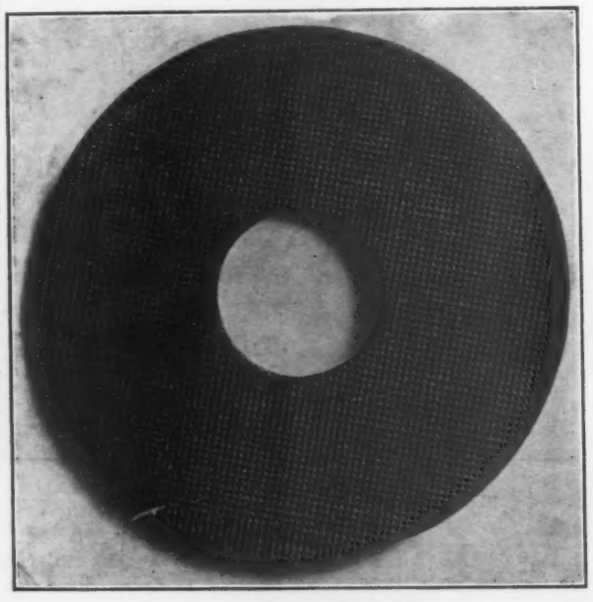


Fig. 7.—One of the Same Disks of Finer Grain.

and being lighter in color shows very plainly the corrugated surface which produces the mechanical tilting of the abrasive grains.

The Globe Machine & Stamping Company, Cleveland, Ohio, is successfully operating a Sherardizing plant, working under the rights purchased some time ago by the United States Sherardizing Company, New Castle, Pa. The Globe company not only Sherardizes metal articles but designs and equips such plants for manufacturers who do not care to send out their work.

The Seaver Coke Pusher and Coal Leveler.

In connection with the Koppers by-product coke ovens, which the Illinois Steel Company is building at Joliet, Ill., three coke pushers and coal levelers of a new type, designed by John W. Seaver, consulting and contracting engineer, Cleveland, Ohio, are to be installed. The machines are of the combination type—that is, each consists of a coke pusher and a coal leveler carried on one frame. Two of these machines will have sufficient capacity to take care of the requirements of the ovens, leaving the third as a reserve. They are all duplicates and all parts are interchangeable.

As shown in the illustrations the main frame consists of four riveted girders well braced together. These girders rest on end trucks which are steel castings of the box type, of standard crane construction, so arranged that the track wheels may be readily removed. The thrust of the pusher ram is taken by two horizontal castings, the shafts of which are carried by the front truck wheels; this construction does away with any strain in the flanges of the track wheels. The pusher ram is of the box girder type 61 ft. long, and is of unusually heavy construction; it is composed of two 31 x ½ in. web plates, two 14 x 1 in. flange plates and four 6 x 3½ x ½ in. flange angles. Each member is a continuous piece, there being no splices. To the bottom of the ram is attached a rack for moving it. This is a steel casting 14 in. wide by 2½ in. thick, with shrouded teeth of 3-in. pitch and 10-in. face. The sides of the ram are protected from the heat of the oven by removable asbestos shields. The front end of the ram is a steel casting 1½ in. thick, and is provided with adjustable side and bottom rolls. The ram rests on flanged rolls 14 in. in diameter, and is traveled back and forth by a pinion driven by a train of spur gears connected to a 50-hp. motor.

The coal leveler is of the ladder type, consisting of two bars 10 in. deep, tapering to 2½ in. deep at the front end. This ladder leveler is traveled by a plow steel wire rope, which is attached to the rear end of the ladder, and is so arranged that it never enters the ovens. The rope is wound on a grooved drum, which is connected to a 25-hp. motor by a train of spur gearing. This gearing is so arranged that the ladder may be run into the oven or withdrawn from it, and at any desired point in the stroke an automatic vibrating arrangement can be brought into operation, so that the ladder makes a stroke of 5 ft. backward and forward, thereby leveling the coal. This motion is entirely automatic and is under the control of the operator.

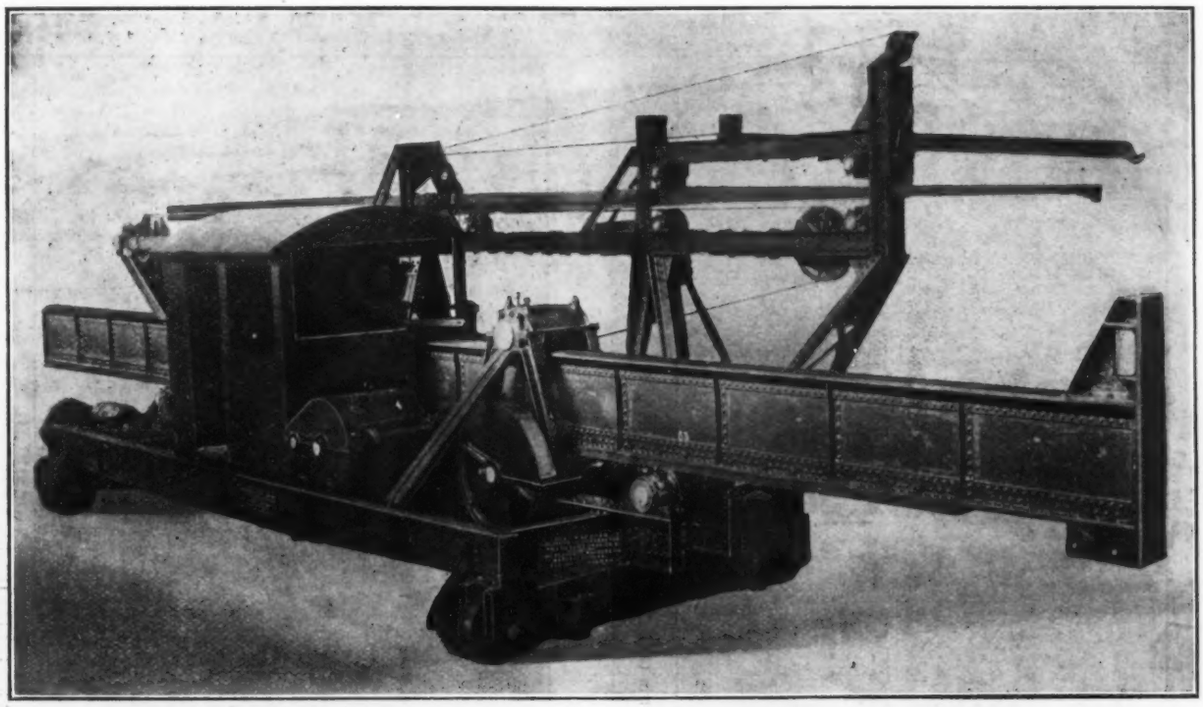
The leveler ladder and the pusher ram are fitted with automatic switches for cutting out the electric current at the ends of their strokes in both directions. The sets of gearing for the pusher ram and the leveler ladder are each mounted on an independent bed plate which contains the bearings for the motor and the shafts, so that each set of mechanism is tied together and entirely independent of the framework, thereby preventing the gearing from getting out of line. By lifting out the bed plates the entire sets of gearing are taken out. Every shaft is readily accessible. Located directly over the leveler ladder and worked from the operator's cab is an arrangement for lifting and supporting the leveler doors, which are independent of the pusher doors.

The hand traveling gear placed in the operator's cab is so arranged that the operator can cut off the current from the traveling motors and adjust the position of the machine in front of the ovens by hand. A powerful boot brake is arranged to lock the machine on the track at any desired position. In the operator's cab recording voltmeters and ammeters show the time of and power taken by every stroke of the machine.

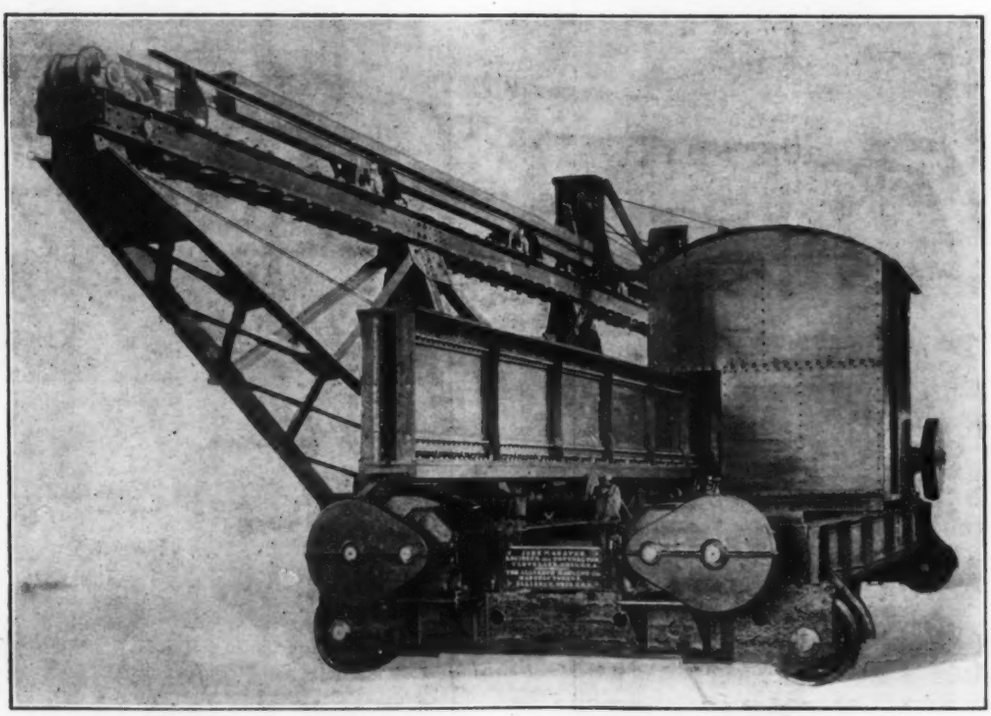
The motors are of the Crocker-Wheeler mill type and rating, series wound. One of 50 hp. operates the ram travel, one of 25 hp. the leveler ladder, and two of 25 hp. travel the machine. All of these motors are operated by General Electric controllers. The two 25-hp. motors for the machine travel and the 50-hp. motor

for the ram travel are controlled by one 50-hp. controller to which they are connected by a double-throw switch. The machine is designed to travel on the tracks at 300 ft. per minute, to move the ram at the rate of 80 ft. per minute, and the leveler bar at 120 ft. per minute.

The construction of the machine throughout is substantial; the castings are bronze or steel, no cast iron being used in the machine. Every part has a factor of safety of not less than six, with the electric motors carrying an overload of 50 per cent. With the exception of the shrouded teeth for the ram travel all of the gears have cut teeth. The shafts are fitted with removable bronze bearings, made in halves. All of the bolts are of the through type, no studs being used. In the designing of the machine especial attention was paid to arranging every part for ready inspection and removal. Over all the gears are placed plate steel cases. The bearings are provided with either compression grease cups or oil reservoirs. The machines were built for John W. Seaver, by the Alliance Machine Company, Alliance, Ohio.



A View of the Seaver Coke Pusher and Coal Leveler Showing the Side and Front End.



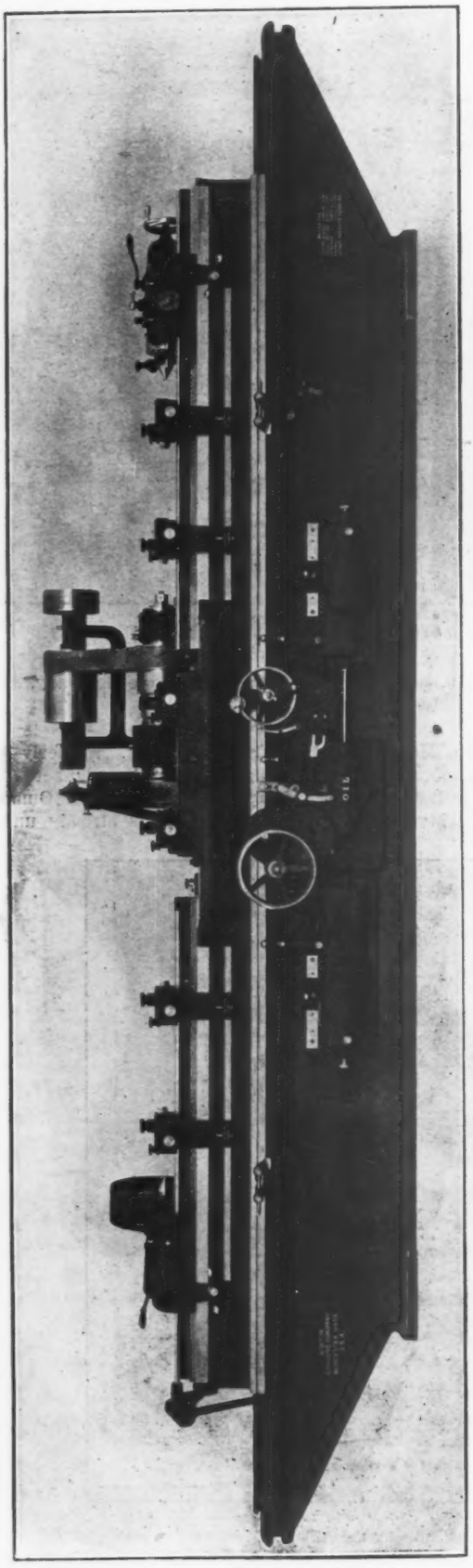
A Rear View of the Seaver Coke Pusher and Coal Leveler as Built by the Alliance Machine Company.

The Howard Stove Mfg. Company, formerly of Savannah, Mo., is preparing to move its plant to the new industrial town of Ralston, near South Omaha, Neb., where construction of buildings is already under way. The plant will consist of a foundry 65 x 150 ft.; warehouse 60 x 100 ft.; factory building, 80 x 120 ft.; and an office building, 30 x 60 ft., of brick and frame construction. Work is being vigorously pushed in order to have the plant in operation in time to participate in the trade of the coming season.

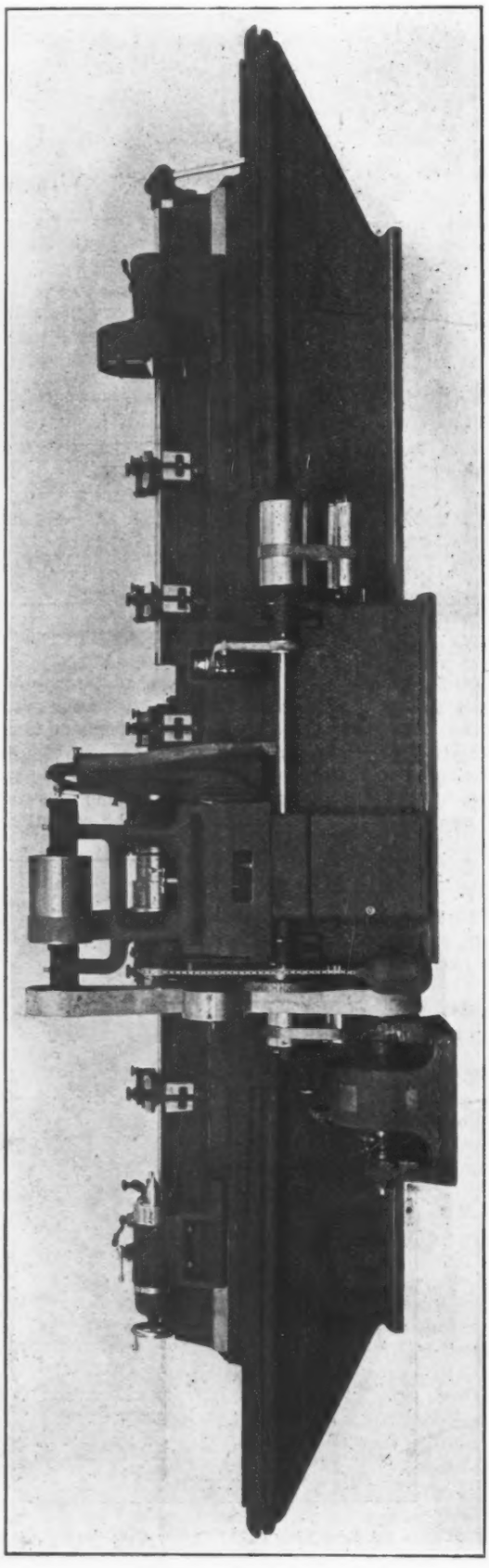
A New Self-Contained Norton Cylindrical Grinder.

The cylindrical grinding machine shown in the illustrations was built by the Norton Grinding Company, Worcester, Mass., for a German railroad works for grinding crank pins, valve stems, truck axles and piston rods, the pistons having extension rods. The type is known as the 20 x 32 x 168 in. self-contained electrically driven machine. It swings 20 in. except at the gap where it is arranged to swing 32 in. This particular machine as shown has its gap 44 in. in length in the center of the table, but the gap can be of any length desired and in any position on the table to suit the work for which the machine is intended.

The steady rests are mounted on a base arranged to be moved along the front edge of the gap to accommodate different thicknesses and different positions of pistons. The rests may be removed, with their base, to give a clear space over the entire bed. The footstock is designed for delicate adjustment to secure straight work,



Working Side of the New 20 x 32 x 168 In. Cylindrical Grinder Built by the Norton Grinding Company, Worcester, Mass.



Rear View of the New Self-Contained Norton Cylindrical Grinder, Showing the Driving Motor.

and both the head and the foot stock are made unusually heavy to insure durability as well as accuracy when heavy work is supported.

The general details of design and construction are similar to those of the standard Norton grinders, and the same care in workmanship is given its construction. The total weight of the machine is 25,000 lb. It measures 22 ft. in over-all length. The grinding wheel used is 24 in. in diameter with 4 in. face.

Because of its unusual length special provision is made for leveling and straightening, a foundation being necessary. The plates shown on the floor in the photograph will be imbedded in the foundation to a straight edge and level. The wedges are adjusted by two nuts, one on either side of the raised end of the wedge, and operated on threaded studs fixed in the base of the machine. Both plates and wedges are machined to insure broad, permanent contact.

The electric power is so applied, as shown in the rear view of the machine, that no extra floor space is required, as the motor stands within both rear and end lines of the base. The machine requires 20-hp. motor, and in ordinary use the power consumed will vary from 5 to 20 hp., according to the character of the work and the ambition of the operator in producing it. When the maximum power is utilized maximum results in the way of production will be obtained, assuming of course that when the maximum power is employed it will be because the work is large and heavy. For smaller work the power required is proportionately less.

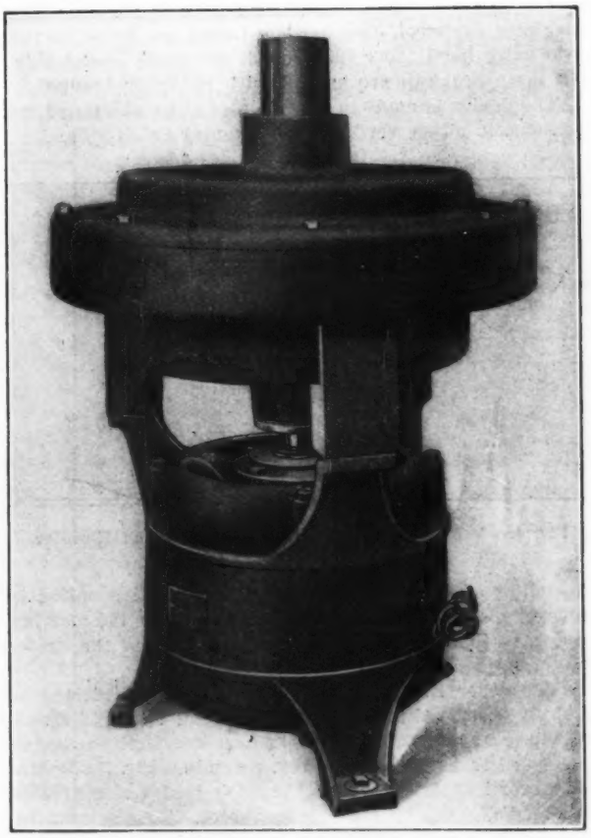


Fig. 3.—A 5-Hp. Vertical Drive Mounted on the Motor.

The O'Kelly Speed Reducing Gear.

To reduce the speed in any required ratio from a motor or driving shaft to a machine or driven shaft is the function of the O'Kelly speed reducing gear manufactured by the D. O. James Mfg. Company, 351 West Monroe street, Chicago, Ill. The device is especially adapted to transmissions where a considerable speed reduction is required and for such often has advantages over belts or plain gear reductions, as it gives a positive drive in a compact form and continues the drive in the same line—that is, the axes of the driving and driven shafts are coincident. It is claimed to be efficient, durable and strong. Being entirely inclosed and oil tight, it is itself protected from injury from outside sources and offers no menace to operatives working about it, and when once supplied with oil requires practically no attention for months at a time.

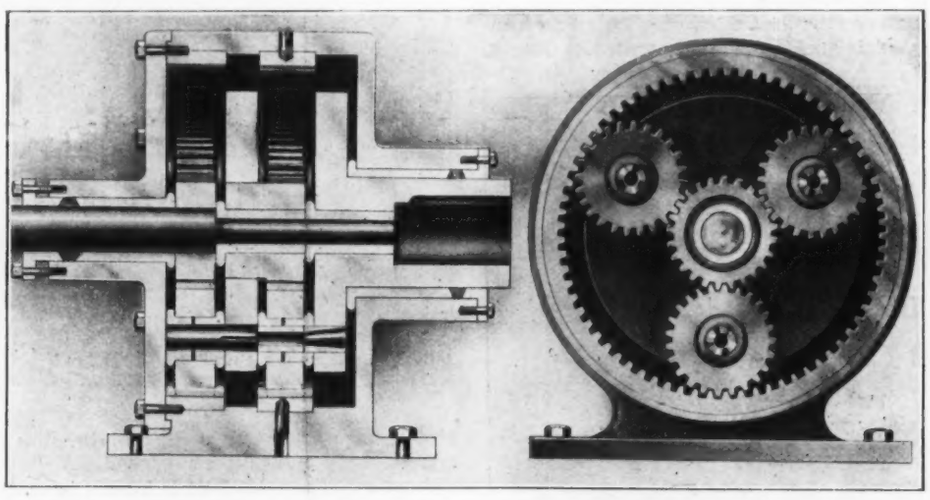


Fig. 1.—Longitudinal and Cross Sections of the O'Kelly Speed Reducing Gear Made by the D. O. James Mfg. Company, Chicago

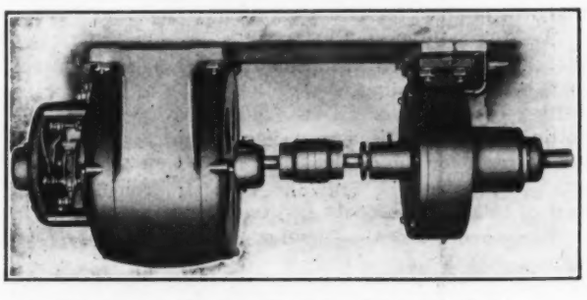


Fig. 2.—A 5-Hp. Line Shaft Speed Reducing Drive.

The construction is exposed in Fig. 1. All the moving parts run in the same direction, and the power being transmitted through three intermediate pinions in each reduction a balanced drive is obtained. The annular or internal gears are fixed in the casing and are made of semi-steel. The idlers are made of steel and run on hard steel bushings. The revolution of the driving gear, the internal gear being fixed, produces an orbital movement of the idlers, which is transmitted through the studs on which the latter are mounted, to the disk in which the studs are fixed, causing the latter to revolve at a speed much slower than that of the driving shaft. This disk may connect directly to the coupling for the delivered drive, as is the case in the single reduction devices, or it may carry a spur gear which as a driving gear through

a second train of idlers still further reduces the speed. In Fig. 1 such a double reducing gear is shown. The idler pins are steel, case hardened, and are keyed to the disks with hard taper pins which are easily removable. The main bearings are bushed with phosphor bronze.

The device is made in a variety of sizes and speed reductions, in either vertical or horizontal patterns, and in

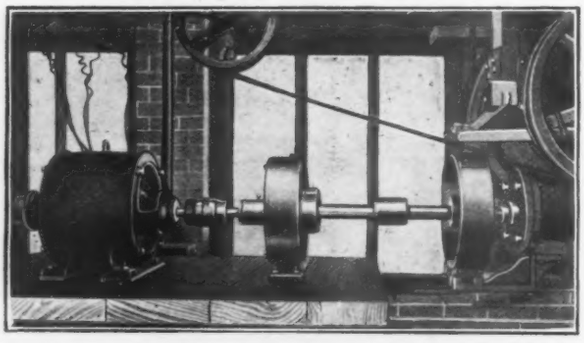


Fig. 4.—A 7½-Hp. 4-to-1 Drive Connected to an Elevator.

capacities of from ⅛ to 50 hp. A universal coupling is generally used to connect the device with the driving motor, so that absolutely perfect alignment of the shafts is not necessary.

The other illustrations show various applications of O'Kelly speed reducing transmission gears. Fig. 2 shows a 5-hp. gear connecting a motor to a line shaft, reducing the speed from 1000 to 150 rev. per min. Fig. 3 shows a 5-hp. vertical drive where the casing of the device is mounted directly on the driving motor. This gives a reduction in a ratio of 73 to 1, and may be placed on the floor as indicated or suspended from the ceiling. It is suitable for any vertical drive.

An instance where the device becomes especially convenient and useful is such as that illustrated in Fig. 4.

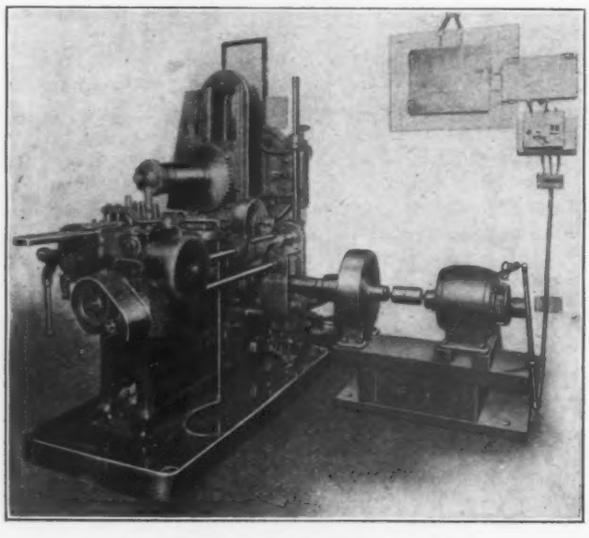


Fig. 5.—A 2-Hp. Drive for a Gear Cutter.

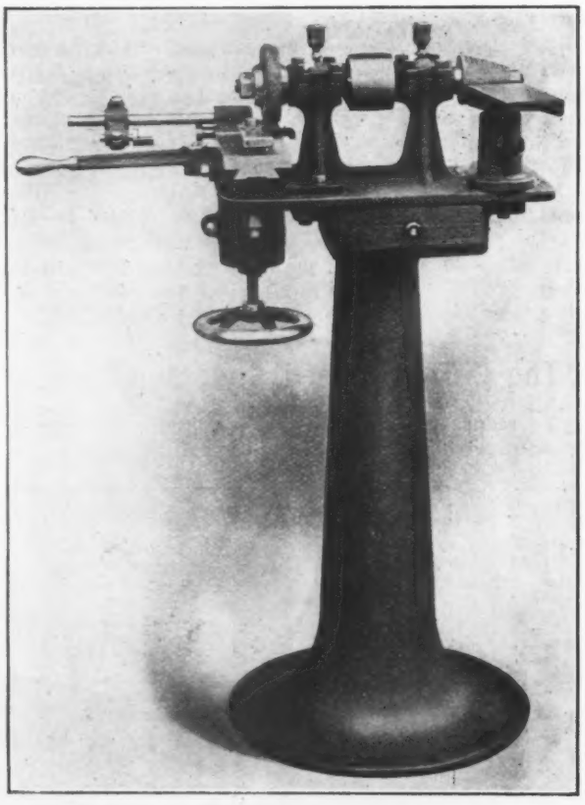
Here a 7½-hp. motor is directly connected through a 4-to-1 reducing gear to a 5000-lb. worm gear elevator, eliminating the belt drive which may in many cases be objectionable. A machine tool drive is shown in Fig. 5, where a 2-hp. motor is connected directly to a Gould & Eberhardt automatic gear cutting machine through one of these transmission devices which reduces the speed from 1800 to 245 rev. per min.

The Hill Clutch Company, Cleveland, Ohio, recently received an order from one of the subsidiary companies of the United States Steel Corporation for 59 friction clutch pulleys. All of these pulleys are to be of one size and fitted with the new 1908 positive action Hill clutch, which was chosen by the purchaser after a competitive test of a number of the various makes of clutches.

The Bignall & Keeler Pipe Die Grinder.

As a maker of pipe threading machinery the Bignall & Keeler Mfg. Company, Edwardsville, Ill., is naturally in position to know how pipe dies should be ground. Its experience with patrons using its machines has also indicated something of the difficulties experienced by them in keeping their dies in proper condition. With the need apparent and the knowledge at hand to relieve it, the company has produced a new pipe die grinding machine, shown in the illustration, that is claimed to be simple and convenient, easily and rapidly operated, and capable of being satisfactorily handled by a boy, as no particular skill is called for.

While important in the cutting ot threads on any pipe, it is particularly necessary for threading the steel



A New Machine for Grinding Pipe Dies Made by Bignall & Keeler Mfg. Company, Edwardsville, Ill.

pipe now so commonly used, that the dies should be of correct shape and properly ground. A die to work well and cut a clean, perfect thread, must have a certain rake and clearance, for without this the threads are torn or stripped. The dies should also be kept sharp and of the right shape, just as much as should lathe or other metal cutting tools. That dies do not generally receive sufficient attention is mainly because the average shop is not equipped to do the work as it should be done, and as a rule the dies are not ground with due regard to the angle that will produce the best results.

As ordinarily ground no two dies are alike, it follows that poor threads will result, more power be required and more frequent sending of the dies to the factory for recutting be occasioned. Dies sent to the factory for recutting often have been so poorly ground that they cannot be recut for the original size and a complete new set must be purchased. With dies properly ground a great deal of this expense could be saved.

The machine, as the illustration shows, has a special formed wheel on one end of the spindle. The die is clamped to the platen beneath the wheel and is moved back and forth with a lever, while at the same time the wheel is gradually raised by means of a hand wheel. The gauge on the platen, against which the die is placed, is adjustable at any angle with the wheel, so that straight thread dies as well as regular taper pipe dies can be

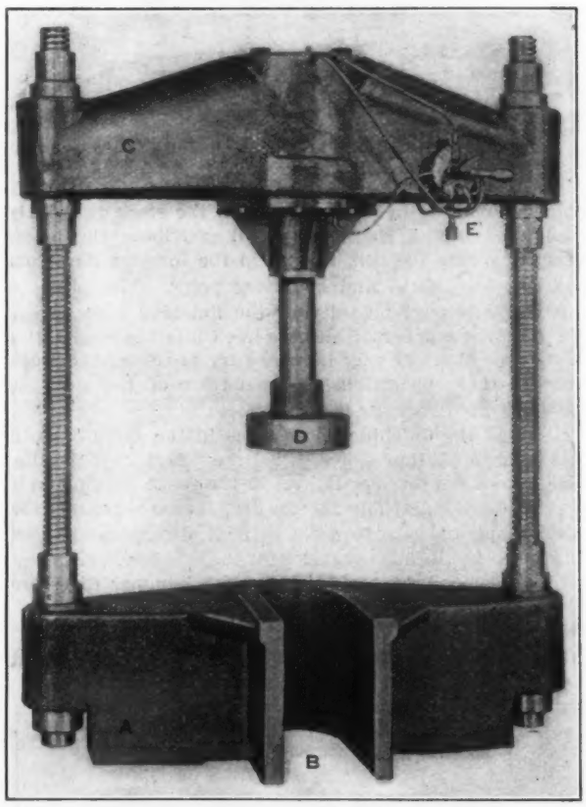
ground. The shape of the wheel gives the die the correct angle of rake. With the machine a wheel dresser is furnished, and also a template to assist in dressing the wheel to the correct shape. The cone shaped wheel on the other end of the spindle is for cutting the lead.

By removing the special shaped wheel and using a straight face wheel, which is also furnished, the machine may be used for grinding other tools. The machine requires 20 x 30 in. floor space and weighs about 425 lb.

The Springfield Pneumatic Press.

Because it has proved to be so useful in its own factory for making press fits, the Springfield Machine Tool Company, Springfield, Ohio, has recently placed on the market the pneumatic press shown in the accompanying illustration.

Primarily it consists of two main frame castings, and two heavy upright screws. The base A is of massive proportions, and is wide enough to permit a 40-in. diam-



A 27,000-Lb. Pneumatic Press Built by the Springfield Machine Tool Company, Springfield, Ohio.

eter wheel to be laid upon it. The opening B which extends back beyond the center of the machine, is for the purpose of making drives where a portion of the work may project some distance below the rest, as is the case in driving lathe spindles into face plates. It facilitates this work inasmuch as the spindle does not have to be raised a considerable hight and dropped through a hole, but is merely set in the space B. The upper frame C is also very heavy, and contains in its center a cylinder 12 in. in diameter, giving an 8-in. stroke; although if required the stroke can be made longer.

The piston head is fitted with three rings, which prevent air leakage. The lower end of the piston rod carries a heavy shoe D, the central portion of which is filled with babbitt, so that the work will not be bruised when pressure is applied. The two uprights are threaded so that the frame can be raised or lowered, as the nature of the work requires. By using these screws, the press can be made to accommodate almost all classes of work.

The press is controlled by a valve E, shown on the right of the upper frame, which directs the air either above or below the piston, or shuts it off altogether. This valve is simple and unique in its operation; starting its lever from the left-hand position, causes the piston to be raised, a little further movement shuts off the air, and a still further movement in the same direction causes the piston to lower, which permits the full air pressure to be applied to the work. If this pressure does not prove to be sufficient to give the desired results, the controlling handle can be moved still farther which throws into operation a small quick-acting automatic air pump placed on top of the frame C but not shown in the engraving. This pump is capable of raising the pressure 250 lb., when the main line is supplied with 80 lb. pressure. The controlling valve allows a very sensitive adjustment of the piston in either direction, and the parts are so regulated that the piston cannot move too rapidly in either direction.

The press as shown without the pump, when supplied with an air pressure of 80 lb. is capable of exerting 8800 lb. pressure, but when the pump is brought into action, it is capable of exerting 27,000 lb. pressure, which is amply sufficient for most classes of work, within the machine's capacity.

The Output of Mica in 1907.

The forthcoming annual report of the United States Geological Survey upon the production of mica in 1907, prepared by D. B. Sterrett, shows an output valued at $392,111. This product came from 11 States—North Carolina, South Dakota, Alabama, South Carolina, Colorado, New Hampshire, Idaho, Georgia, Virginia, New Mexico and Maine—named in order of value of output. Of these States, Alabama, South Carolina, Georgia and Maine reported no production in 1906, while Connecticut is credited with no production in 1907, as against a small one in 1906.

The production of sheet mica amounted to 1,060,182 lb., valued at $349,311, a decrease in quantity of 412,918 lb. and an increase in value of $82,963 as compared with 1906. The decrease in quantity and the increase in value are due to the fact that, as reported to the Survey, in 1907 a larger proportion of the mica was manufactured than in 1906.

The production of scrap mica amounted to 3025 net tons, valued at $42,800, an increase of 1526 tons in quantity and of $20,058 in value over 1906. The price per ton was $14.15, as compared with $15.27 in 1906.

It is difficult to separate the figures of production for sheet mica from those for scrap mica, since the material used for sheet by one producer might be ground as scrap by another.

The mica industry in the United States was in an especially flourishing condition during the first part of 1907 in many of the producing areas. During the latter part of the year activity in mica production was but slightly decreased by the panic. To judge from conditions during the first part of 1908, it is doubtful whether the effects of the panic will cause a very great falling off in output.

The average price of sheet mica for the United States during 1907, as deduced from the total production, was 33 cents per pound, as compared with 17.7 cents in 1906. The average prices per pound of sheet mica as reported in the production from several States were as follows: Idaho, $1.50; Alabama, 72 cents; South Dakota, 33.4 cents; North Carolina, 32.5 cents; South Carolina, 30 cents; New Hampshire, 20.6 cents; Virginia, 17.7 cents; Colorado, 9 cents. With the exception of Colorado, the average price of sheet mica in all of these States was considerably higher in 1907 than in 1906, and the figures bring out well the fact that a much larger proportion of manufactured mica was included in these reports.

The average price of scrap mica during 1907, as obtained from the table of production, was $14.15 per ton, as compared with $15.2 in 1906. The average price paid for scrap mica in North Carolina during 1907 was $11.12 per ton, an increase of 55 cents over 1906. In the remaining States the average price was $16.65 per ton. The prices of scrap mica reported by dealers in the several States are so variable, dependent on their transportation and market facilities and on the grade of mica, that it is impossible to state a definite price.

Drop Forging.

Before the invention of forging with dies, or what might be called "machine blacksmithing," and when a hand or power hammer was all that was available, it was impossible to cheaply produce uniform forgings. The situation is entirely changed now and in the present state of the art drop forgings can be made of tobin bronze, copper, aluminum, iron or steel, using for the purpose dies which are made in two parts. These dies are often so made as to combine in one set the roughing or "breaking down" form in addition to the finishing form, although many forgings require separate breaking-down dies and several forming dies, depending on the shape of the forging to be produced.

To determine the proper shape for the breaking-down

Fig. 1.—A 600-Lb. Drop Hammer.

form it is common practice to make several tests by which it is decided how best to distribute the metal, according to the stock used and the finished article to be produced. These dies are operated in what are known as drop hammers, the size of which is governed by the work to be done. The falling weight may be as light as 50 lb. or as heavy as 5000 lb. Fig. 1 shows a drop hammer with a 600-lb. falling weight. One-half of the die is fastened to the ram or hammer which moves vertically between two guides or uprights, being raised by friction rolls which are under the instant control of the operator. The other half of the die is in the anvil or base of the hammer. The ram of the hammer is lifted until automatically released, the height of the fall being controlled by adjusting the dogs on the side rod which release the lifting rolls. Then the hammer falls, striking the previously heated bar or billet with the upper half of the die and driving it into the lower half of the die. By a

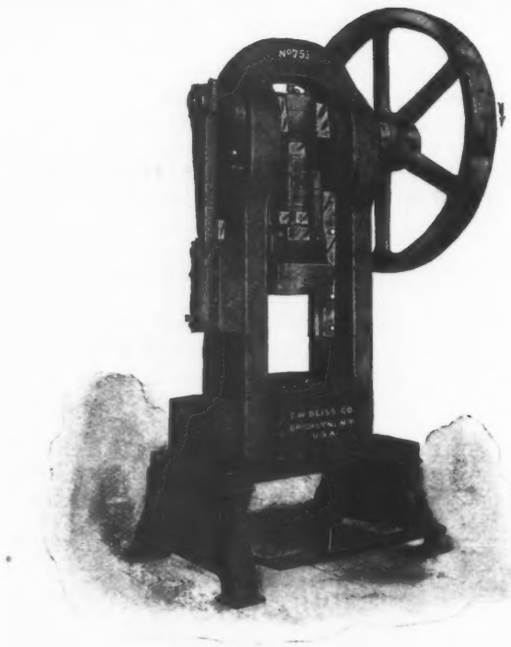


Fig. 2.—A Straight-Sided Trimming Press.

number of blows in rapid succession the stock is quickly hammered into a shape that will distribute the metal so as to secure the best results in the forming die from both an economical and operating point. The piece in this shape is next placed over the finishing form in the die and by a number of blows forced into the concavities in the two dies. It may be necessary to reheat the stock between these operations if the nature of the work or the stock used compels it.

Around the finishing depressions in the faces of both dies is cut a shallow space called the "flash" of the die. This allows for the inequalities in the rough forging, as it is practically impossible for the drop forger to produce the exact shape and size required without surplus metal, and this space in the flash provides for the overflow. The forging as it comes from the finishing drop hammer therefore has a fin formed where the upper and lower dies meet. This is removed in trimming dyes operated in a type of press such as is shown in Fig. 2, and usually located

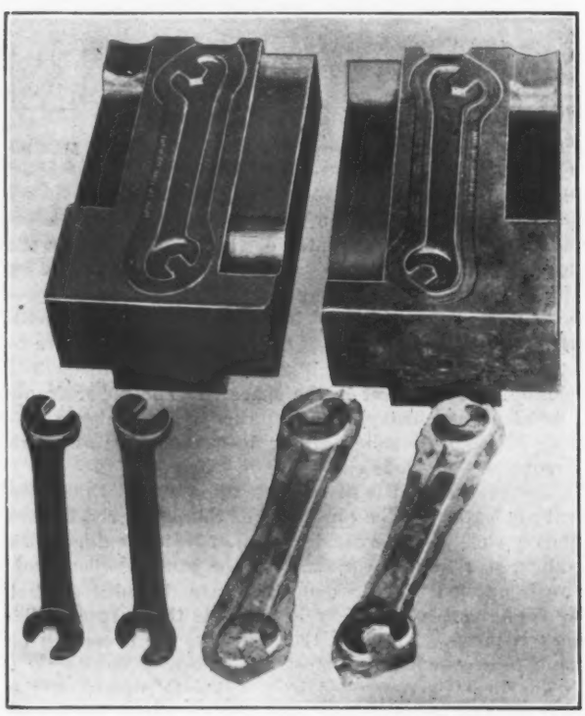


Fig. 3.—An Example of Drop Forging Dies and Their Product Before and After Trimming.

alongside of the hammer. The character of the trimming is such that cut-back or overhanging frames are often more convenient than those of the straight-sided pattern as illustrated in Fig. 2; this overhanging type is particularly adapted for trimming long drop forgings, as the stock can readily be fed from right to left through the throat of the frame. When trimmed the forging is either annealed or pickled, or, if necessary, both, after which it is ready for the machine operations if there be any. Fig. 3 shows a pair of dies and its product before and after being trimmed.

The endurance and effectiveness of drop hammers depend in no small degree upon the proper ratio between the weight of the base and the weight of the hammer. It has been demonstrated that 12 to 1 is decidedly better than a smaller ratio, and that the best results are obtained with a ratio of 15:1 or 16:1 with all parts made

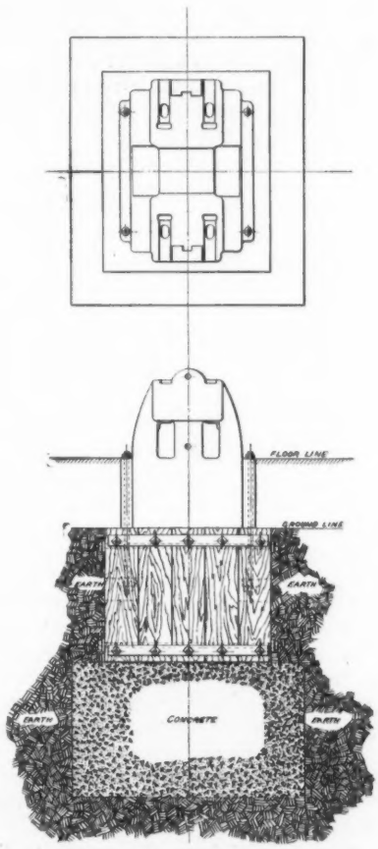


Fig. 4.—Plan and Sectional Elevation of a Drop Hammer Foundation with Wood Cushion.

in proportion, the extra cost of the heavier machine being more than compensated for by the larger quantity and better quality of the finished product and by the comparative freedom from breakdowns.

For the successful operation of drop hammers it is very essential to have a good foundation; either one of the types illustrated in Figs. 4 and 5 have been found satisfactory. The wood cushion foundation, shown in Fig. 4 is used where the ground is not very good and where jarring of surrounding buildings is objectionable. The solid concrete foundation shown in Fig. 5 is recommended as best when it can be used, as it is like a continuation of the base of the hammer and therefore makes the drop more efficient. In deciding the depth of foundation of either of the above types care should be taken to determine the best point to stop the excavation. Bed rock is the best bottom, cement gravel next best, and then a strata of sand or clay, say 4 ft. thick, which if left undisturbed in its original condition also makes a good bottom. The trouble with sand or clay is, that the heat of a drop forge shop dries the soil, and with the continual jar they are apt to shift if they have opportunity to do so. By flaring the bottom of the foundation the desired result is sometimes obtained without going very deep, but

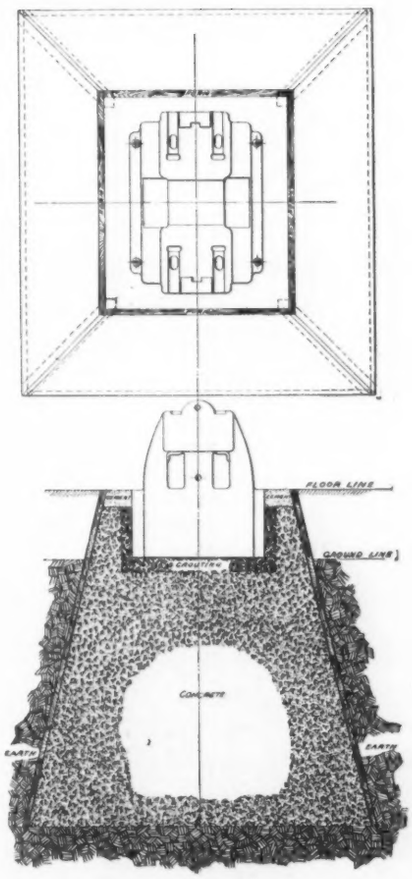


Fig. 5.—Plan and Sectional Elevation of a Solid Concrete Drop Hammer Foundation.

for any size of drop hammer the concrete should not be less than 4 ft thick, whether the wood cushion is used or not.

The forgings produced by the drop hammer are perforce uniform, being formed in the same dies and under similar conditions. Difficult shapes can be readily, rapidly and accurately made, leaving allowances for machining if desired, or finishing where no machine finish is required. In the latter case the cost of manufacture is greatly reduced and the smooth and accurate surface left from the dies generally answers for such articles as handles, wrenches, cranks, connections and bossed parts. Or, should appearance require a bright and polished surface, such may be given by an emery wheel or buffing machine.

The field for drop-forged products is very large; in fact, almost unlimited. There is a great demand for them in the manufacture of firearms, sewing machines, bicycles, automobiles, engines, railroad cars and in many kinds of machinery. The economy in the use of drop forgings has been recognized to such an extent that in many instances steel castings are being replaced by drop

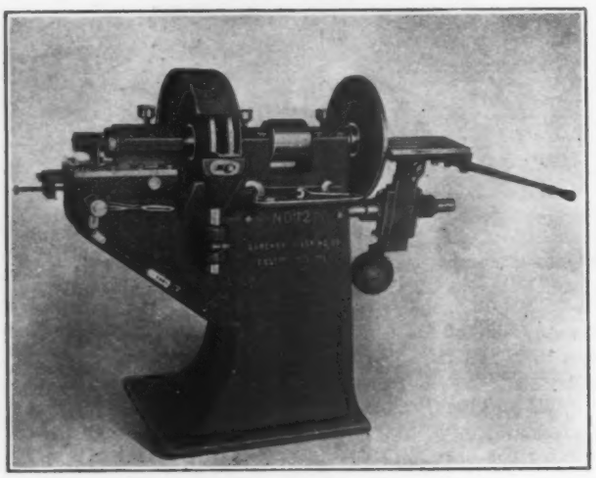
Fig. 6.—Drop Forgings in a Variety of Sizes and Shapes.

forgings where the strain requirements are great and the part requires considerable machining, as by their use the amount of machine labor necessary is very materially reduced, in addition to overcoming the loss consequent with castings developing bad spots. Fig. 6 shows an assorted lot of forgings produced in machinery made by the E. W. Bliss Company, 11 Adams street, Brooklyn, N. Y., which makes a specialty of drop forge equipments, including dies.

The No. 12 Combination Gardner's Improved Disk Grinder.

The Iron Age of July 12 contained an illustrated description of the No. 12 Improved disk grinder built by the Gardner Machine Company, Beliot, Wis., a machine for rapidly grinding the parallel faces of small pieces. The machine herewith illustrated is the same machine with the addition of a single disk and a swinging work table at the right end, and is known as the No. 12 Combination Improved disk grinder. Patents have recently been allowed covering this machine.

As with the standard No. 12 grinder, the principal feature is the one-belt drive, a single belt driving the two



The No. 12 Combination Improved Disk Grinder Built by the Gardner Machine Company, Beloit, Wis.

wheels for double face grinding, and the single wheel at the right end of the machine. The construction and operation of the double face grinding part, having already been described, need not be repeated. This part of the machine is regularly provided with a dust shield opening into the base of the machine and a connection for an exhaust pipe.

The right end is equipped with a single wheel on the spindle and a rocker shaft fastened in the base of the machine, on which any style of work table may be used. As shown in the engraving, a universal lever feed table is mounted on the rocker shaft. This lever feed table has vertical and angular adjustment and is counterbalanced. The top surface of the table is provided with three T slots for bolting fixtures or holders for work. The table is operated by a hand lever and is governed by a micrometer stop screw graduated to 0.001 in. The use of the lever feed table is recommended for manufacturing operations where rapid handling of duplicate pieces is required.

When the right end of the machine is being used alone, the movable head of the double disk grinding part may be uncoupled from the rest of the machine. Also when the machine is not being used for double face grinding the movable head may be removed and special tables substituted for single face grinding. The disk wheels are fastened to the spindles by countersunk screws.

Of this machine the same is true as of the standard No. 12 with regard to the rigid construction, lubrication and the exclusion of dust from all wearing surfaces. Disk wheels of either 15 or 18 in. diameter may be used. At the left end of the machine the maximum distance between the wheels is 4½ in., which in most cases is ample, but this space may be increased to suit special work. The weight of the machine with all accessories, including setting up press for wheels, countershaft, supplies, &c., is 2200 lb.

Canada's Import Trade.

TORONTO, July 27, 1908.—In the next twelvemonth Canada's imports are certain to be large, possibly larger than in any former year. The conditions preparing for this development were pointed out in a previous letter, wherein it was shown that the growing crops foreshadowed an agricultural yield far in excess of any ever taken off Canada's soil before, and wherein it was maintained that the manufacturing industries of the country did not appear to be anticipating any such demand as the farmers will be presenting. If the Canadian manufacturers of staple articles had financial resources corresponding in all cases to the capacity of their plant and equipment, the goods required would doubtless be turned out, but not a few concerns will have to keep down their output because funds are lacking to spread out. Two years ago there would have been no trouble about the funds, and, indeed, there was none, but it is different now. A factory in which 100 hands were maintained in employment then may not be able to keep more than half the number the next year, notwithstanding that fundamental conditions and the aggregate buying power of the country may be superior to what they were then. The difference in financial accommodation is the result of conservatism on the part of the banks, who were a little too optimistic during the good times. They are not furnishing capital now as in some cases they undoubtedly were when things were flourishing and there seemed no risk in anything. But the banks learned that a "boom" in the first years of the twentieth century is pretty much the same as "booms" have always been, and they are now dispersing credit warily. Three bank presidents—B. E. Walker of the Bank of Commerce, E. B. Osler of the Dominion Bank and D. R. Wilkie of the Imperial Bank—were interviewed by the Toronto *Mail and Empire* a few days ago and gave opinions that certainly could not be encouraging for the watchers for a fresh outbreak of commercial intemperance. All these bankers conceded that a magnificent crop would do wonders, but all likewise declared that the country could not take to the leaping and bounding gait for at least another year. This means, first, that the banks are not going to take such chances as they did, and also that many of the manufacturers were too hard hit by the recent reaction to be in a position for doing business at full rush.

But the farmers will have the money to buy goods, more goods than the Canadian manufacturers appear to be in a state of preparedness to produce. Of course, there is a great aggregate of indebtedness to be paid off by the farmers, who owe for merchandise, for implements and for luxuries bought on credit when times were good, and owe, too, on land purchased at high speculative prices. After paying off all they owe, however, the farmers will have scores of millions to spend. Their crop prospects grow brighter every day, and their wants have been accumulating in the recent dull times. Articles which they had to deny themselves last year because of crop disappointment and debt, they will hasten to buy this year. Whoever is first ready with the goods will get the market in Canada. In the West there is sure to be a great inrush of American manufacturers. Ontario will absorb a large quantity of imports if the home manufacturers are not prompt with delivery or if home stocks become depleted, for Ontario will have a big buying power, too. Already the bills drawn against Ontario and Quebec cheese exports are bringing in British money in large volume. The farmers are depositing their cheese checks, and in this way contributing to the financing resources of the banks. With their deposits increased, the banks can with greater ease supply money for the grain movement that will soon be on their hands. The enormous dairy output that timely rains have swollen will bring much money into the country. C. A. C. J.

The New Rockford Shaper Single Pulley Drive.

Among the machine tool builders who have shown recognition of the popularity of the single pulley constant speed drive is the Rockford Machine Tool Company, Rockford, Ill. After 18 months of satisfactory use in its own shop of a 16-in. shaper equipped with a positive speed changing device the company is preparing to offer this style of drive regularly on the Rockford shapers. Fig. 1 shows a machine of this size direct connected by gearing to a Northern 2-hp. constant speed motor, which has a friction clutch for stopping and starting the machine without stopping the motor. The only difference in the machine when fitted with a plain pulley to be driven by a countershaft is shown in Fig. 2. The simplicity of the speed changing mechanism will be clearly understood by referring to Fig. 3, which shows a side elevation and cross section of the drive when equipped with a friction clutch pulley, which may be driven by belt direct from the line shaft, no countershaft being necessary. The machine has eight speed changes to the ram, ranging by even progression from 12 to 90 cutting strokes per minute.

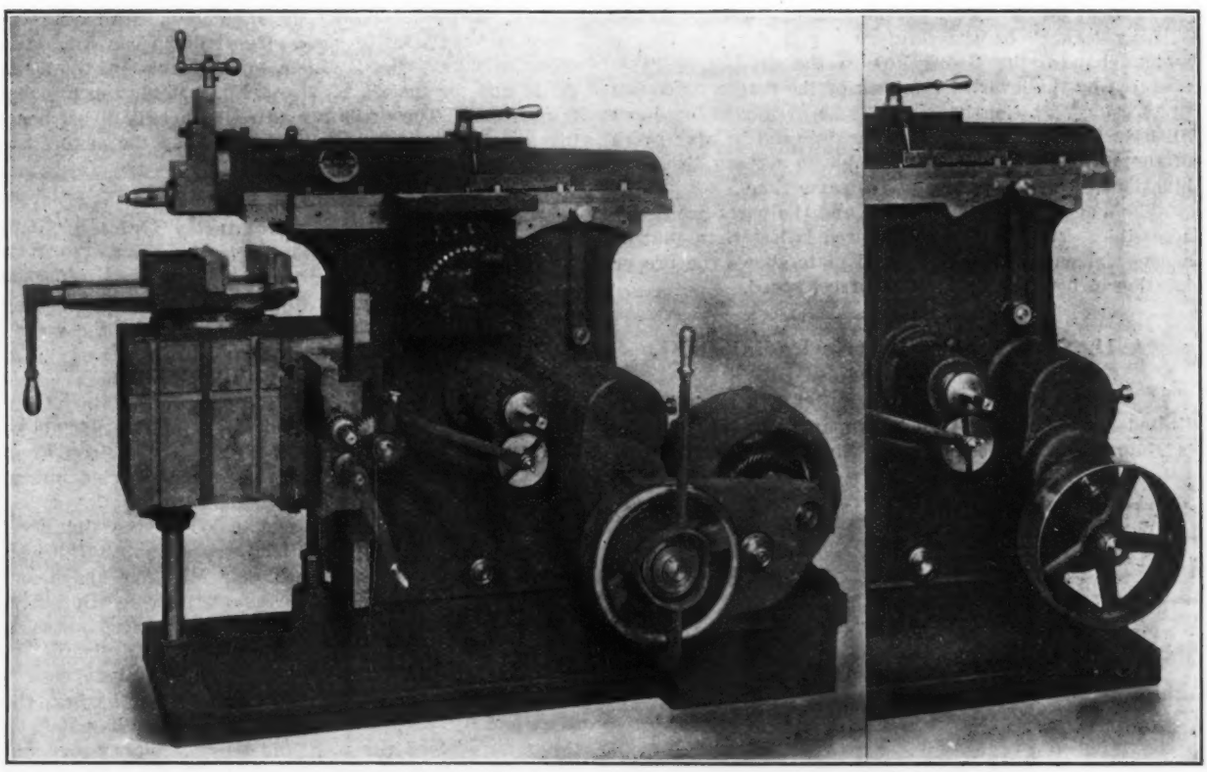


Fig. 1.—A 16-In. Rockford Shaper with Constant Speed Drive from a 2-Hp. Northern Electric Motor.

Fig. 2.—The Positive Speed Changing Device for Belt Drive.

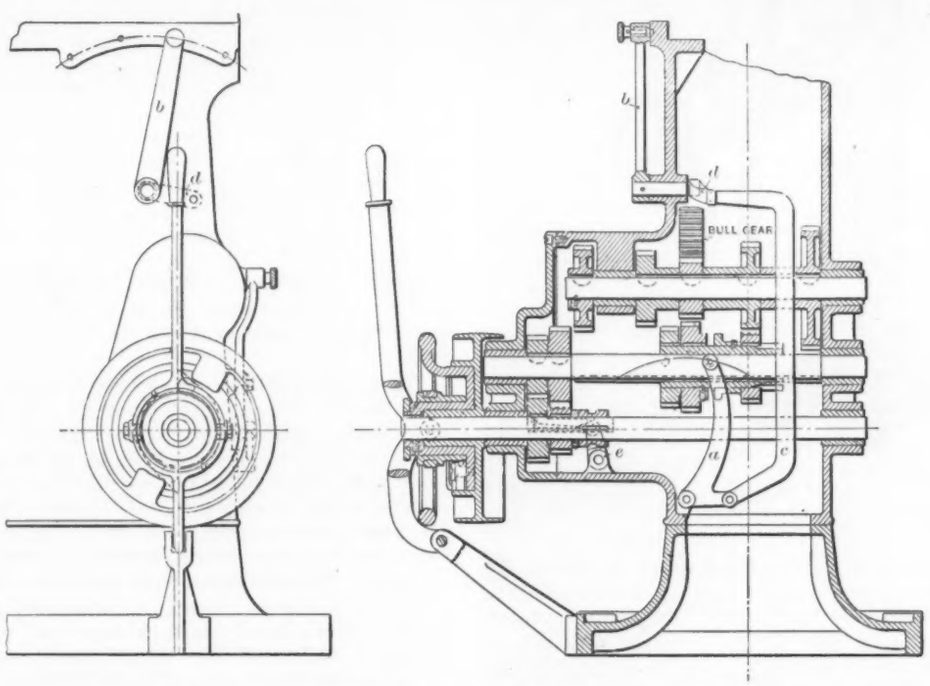


Fig. 3.—Side Elevation and Cross Section of the New Shaper Drive Made by the Rockford Machine Tool Company.

The arrangement of the gearing and shifting mechanism is clearly shown in Fig. 3. The lower shaft carries the friction pulley and two driving gears, one of which is locked to the shaft by the spring key. The other runs loose, and is driven by its mate on the second shaft. It

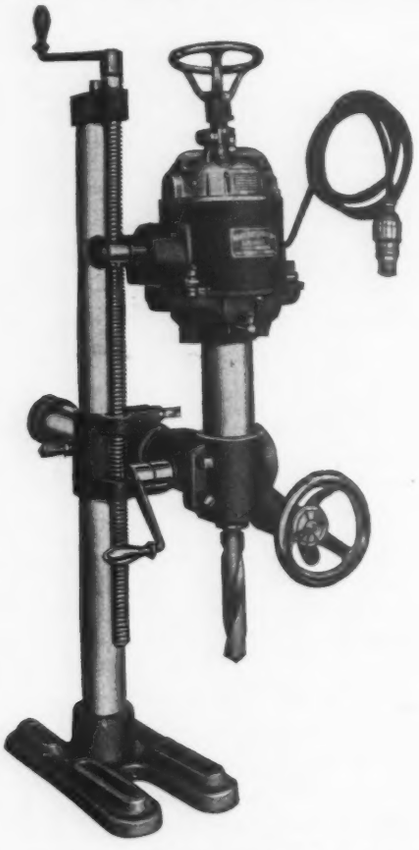
runs at a very low velocity, as the driving gears both run in the same direction, and the movement of the loose gear takes care of the difference in ratio of the two pairs.

A sleeve keyed to the intermediate shaft carries four gears, any one of which may be engaged with its corresponding gear on the upper shaft. The arm *a* for moving the sleeve and gears in the shaft has a bearing at its lower end and carries a steel pin, which operates between two flanges on the sleeve. This arm is connected to the shifting lever *b* by the forgings *c* and *d*. The fork *e* which changes the spring key in the driving gears is operated by the lever at the back of the frame, as shown in the side elevation in Fig. 3. The arrangement places all levers on the front of the machine and in easy reach of the operator, and it is impossible to get any two combinations of gears in mesh at the same time.

The machine is very compact, and the parts are easily accessible. The floor space required is less than that of a cone driven machine. A speed plate shows the proper location of both levers for the correct speed.

A U. S. Portable Electric Radial Drill.

A portable electrically driven radial drill made by the United States Electrical Tool Company, Cincinnati, Ohio, is shown in the accompanying illustration. This drill



The New Portable Motor Driven Radial Drill Made by the United States Electrical Tool Company, Cincinnati, Ohio.

has a 5-in. feed through the hand wheel, shown at the right of the spindle, and quick return through the handle on the other side of the spindle. Through a rack and pinion on the radial arm the reach of the drill can be varied up to a maximum radius of 32 in. in any direction in a horizontal plane, and the spindle may be swiveled in a vertical plane, so that it is possible to drill at any angle. By means of a graduating line on the radial arm the spindle may be brought back to exact vertical position without the use of a square. The drill is fitted with an eyebolt at approximately its center of gravity by which it may be lifted and carried about the shop by a crane, or two men can carry it by placing a bar through the eyebolt, as the weight of the drill is only 160 lb.

These drills are operated from an ordinary incandescent lamp socket, and are made for either direct or alternating current. The vertical column, as well as the horizontal arm, is of hollow steel tubing, and the column is fitted with a screw to raise and lower the horizontal arm. The starting device or switch for the motor may be seen on the left of it in the illustration. This is inclosed, and the drill is started or stopped by pulling or pushing the switch plunger. The hand wheel on the top of the motor is for knocking out the twist drill. These machines are made in two sizes, one drilling up to ⅞ in. in steel, and the other up to 1¼ in. in steel. The hole in the spindle is made to take a No. 2 Morse taper shank for the ⅞-in. drills, and for the 1¼ in. size a No. 3 Morse taper socket is provided. The drills are fitted with ball thrust bearings on the chuck end of the spindle, and the motors are of the air cooled type.

The Gary Harbor Formally Opened.

The formal opening of the harbor at the new Gary steel plant of the United States Steel Corporation took place July 23, when with fitting ceremonies the steamship E. H. Gary landed the first ore cargo, consisting of 10,000 tons, at the furnace docks. An elaborate programme of exercises had been arranged by the Gary Commercial Club. With the co-operation of the officials of the Indiana Steel Company and the Illinois Steel Company and distinguished guests this was carried out in an interesting and impressive manner.

Responding to invitations extended by the club, over 500 guests boarded the E. H. Gary at South Chicago, which at 12 o'clock left the harbor for Gary under convoy of the United States vessels Wolverine, Dorothea, Tuscarora and Sumac. A buffet lunch was served on board, and the Illinois Naval Reserve Band lent inspiration to the occasion by the rendition of patriotic airs. On arrival at Gary, as the steamer entered the harbor, the Stars and Stripes were run to the top of the flag staff on the outer end of the pier, and as the colors broke out from the staff the gunboats began firing a salute of 21 guns, which was accompanied by the screech of whistles and the cheers of thousands of workmen who lined the docks.

On arrival at the dock and before leaving the boat brief addresses were made by John W. Kern, of Indiana, the Democratic candidate for Vice-President; Congressman James R. Mann of Illinois, State Senator A. J. Bowser of Indiana, Congressman E. D. Crumpacker of Indiana, William Livingstone of Detroit, president Lake Carriers' Association; H. Coulby, president Pittsburgh Steamship Company, and W. P. Gleason, superintendent Indiana Steel Company, all of whom spoke of the magnitude of work undertaken at Gary and the marvelous success of its development. At the conclusion of the speaking an exhibition of the operation of the ore unloaders was given, when the grab bucket descended into the hold and transferred the first ore into the storage bins.

Under the guidance of the officials and department heads of the Indiana Steel Company, the visitors were escorted on a tour of inspection through the various mills of the plant. The principal building structures were found to be either finished or approaching completion and much of the machinery installed. Work is being steadily advanced, and it was apparent to the observers that before the end of the year the equipment will be ready for operation. The exercises of the day were concluded by a parade headed by an escort of the Gary police, the Illinois Naval Reserve Band, marines from the United States steamship Wolverine, the Illinois Naval Reserves from the steamship Dorothea, and heads of departments of the Indiana Steel Company, which formed in front of the general offices of the plant and marched up Broadway to the Gary Hotel where a reception was held.

Reports of the operation of the Employees' Relief Fund of the Pennsylvania Railroad's lines east of Pittsburgh and Erie show that, including the payments for the month of June, $18,067,948.28 has been paid to members and their families since the organization of the fund February 15, 1886. Of this sum $7,336,574.29 has been

paid to the families of members who have died. The remainder, $10,731,373.99, has been paid to members who, because of illness or accident, have been incapacitated for the work. The payments for the month of June, 1908, amounted to $97,305.

Pig Iron Production First Half 1908.

Only 6,918,004 Gross Tons, Smallest Half Year's Output Since 1900.

The American Iron and Steel Association has just collected complete statistics of the production of pig iron in the United States in the first half of 1908. The total was 6,918,004 gross tons, against 12,303,317 tons in the last half of 1907 and 13,478,044 tons in the first half of 1907. The production in the first half of 1908 was the smallest in any half year since the last half of 1900, when 6,146,673 tons were made. The following table gives the half yearly production since 1905:

Gross tons.	1905.	1906.	1907.	1908.
First half	11,163,175	12,582,250	13,478,044	6,918,004
Second half	11,829,205	12,724,941	12,303,317	.....
Totals	22,992,380	25,307,191	25,781,361	.....

The output by States in the half year, compared with that of the first and second half of 1907, was as follows:

Total Production of Pig Iron by States.

States.	Production.—Gross tons of 2240 lb. (Includes spiegeleisen and ferromanganese.) First half of 1907.	Second half of 1907.	First half of 1908.
Massachusetts and Connecticut	8,746	10,373	5,220
New York	859,125	800,627	376,208
New Jersey	195,245	177,944	125,143
Pennsylvania	5,964,884	5,383,665	3,032,297
Maryland	221,145	190,688	82,785
Virginia	260,912	217,859	137,356
Georgia and Texas	26,173	29,652	5,260
Alabama	861,771	824,903	605,617
West Virginia	151,643	139,423	27,901
Kentucky	79,013	48,933	21,357
Tennessee	193,371	199,735	115,249
Ohio	2,815,174	2,435,513	1,209,399
Illinois	1,263,258	1,194,510	782,865
Indiana and Michigan	197,330	239,177	167,063
Wisconsin and Minnesota	160,045	162,038	69,303
Missouri, Colorado, Oregon, Washington and California	220,209	248,277	154,981
Totals	13,478,044	12,303,317	6,918,004

The production of coke and anthracite pig iron by States, 153 such furnaces being reported in blast June 30, is given in the two following tables:

Production of Coke Pig Iron.

States.	First half of 1907.	Second half of 1907.	First half of 1908.
New York	859,125	800,627	376,208
New Jersey	130,392	125,509	93,897
Pennsylvania	5,270,883	4,821,111	2,822,249
Maryland	221,145	190,688	82,785
Virginia, Georgia and Texas	281,092	236,003	136,852
Alabama	846,034	805,499	596,280
West Virginia	151,643	139,423	27,901
Kentucky	78,423	47,561	20,811
Tennessee	193,016	197,590	114,789
Ohio	2,815,174	2,433,088	1,209,399
Illinois	1,263,258	1,194,510	782,865
Indiana, Michigan and Wisconsin	158,299	199,969	135,814
Minnesota, Missouri and Colorado	245,530	266,818	147,589
Totals	12,514,014	11,458,396	6,547,439

Production of Anthracite and Mixed Anthracite and Coke Pig Iron.

States.	First half of 1907.	Second half of 1907.	First half of 1908.
New York and New Jersey	64,853	52,435	31,246
Pennsylvania	693,381	560,885	209,599
Totals	758,234	613,320	240,845

On June 30 the number of active charcoal furnaces was 15, against 22 on December 31. The production of charcoal pig iron by States was as follows:

Production of Charcoal Pig Iron by States.

States.	First half of 1907.	Second half of 1907.	First half of 1908.
Massachusetts, Connecticut and New York	8,746	10,373	5,220
Pennsylvania	620	1,669	449
Maryland and Virginia	517	927	504
Alabama	15,737	19,404	9,337
Georgia, Texas, Kentucky and Tennessee	6,421	14,098	6,266
Ohio	0	2,425	0
Michigan	143,860	151,062	82,105
Wisconsin, Missouri, Oregon, Washington and California*	29,895	31,643	25,839
Totals	205,796	231,601	129,720

* Produced a small quantity of pig iron with charcoal and electricity.

In the table below the production of all kinds of pig iron in Pennsylvania and Ohio is given by districts:

Production of Pig Iron in Pennsylvania and Ohio.

Districts.	Production.—Gross tons of 2240 lb. (Includes spiegeleisen and ferromanganese.) First half of 1907.	Second half of 1907.	First half of 1908.
Pennsylvania:			
Lehigh Valley	370,941	380,287	221,867
Schuylkill Valley	408,178	346,053	183,207
Lower Susquehanna Valley	342,741	288,438	121,159
Juniata Valley	115,293	140,109	47,679
Allegheny County	2,851,098	2,587,135	1,697,658
Shenango Valley	1,054,302	894,173	452,902
Miscellaneous bituminous	821,711	745,801	307,376
Charcoal	620	1,669	449
Ohio:			
Mahoning Valley	1,097,426	888,801	546,618
Hocking Valley and Lake counties	812,166	742,116	435,655
Miscellaneous bituminous	720,085	630,475	110,847
Hanging Rock bituminous	185,497	171,696	116,279
Hanging Rock charcoal	0	2,425	0

The production of Bessemer and low phosphorus pig iron by States and by the various districts of Pennsylvania and Ohio is shown in the following table:

Production of Bessemer and Low Phosphorus Iron.

	First half of 1907.	Second half of 1907.	First half of 1908.
New York	467,143	462,376	163,984
Pennsylvania:			
Lehigh Valley and Schuylkill Valley	64,788	79,694	62,884
Lower Susquehanna Valley	254,443	160,316	33,148
Allegheny County	1,876,784	1,566,957	1,026,172
Shenango Valley	638,495	551,774	308,886
Miscellaneous bituminous	301,093	241,957	90,187
Total Pennsylvania	3,135,603	2,600,698	1,521,277
Maryland and Virginia	220,989	200,969	83,162
West Virginia, Tennessee and Kentucky	170,826	153,497	59,186
Ohio:			
Mahoning Valley	889,668	680,018	424,518
Lake counties	602,064	534,851	347,931
Hanging Rock bituminous	55,712	32,690	42,056
Miscellaneous bituminous	498,133	417,865	0
Total Ohio	2,045,577	1,665,424	814,505
Illinois	916,089	866,651	663,745
Michigan, Wisconsin and Minnesota	76,505	26,734	0
Colorado and California	153,146	69,393	82,632
Totals	7,185,878	6,045,742	3,388,491

The production of basic pig iron, not including charcoal pig iron, was as follows:

Production of Basic Pig Iron, Not Including Charcoal Iron.

	First half of 1907.	Second half of 1907.	First half of 1908.
New York and New Jersey	114,438	100,759	51,371
Pennsylvania: Allegheny County	881,274	930,733	614,657
Other counties	943,939	828,462	372,212
Virginia and Alabama	250,590	291,666	177,229
Ohio, Indiana, Illinois, Missouri and Colorado	480,895	552,463	266,143
Totals	2,671,136	2,704,083	1,481,612

The production of spiegeleisen and ferromanganese is given in the following table:

Production of Spiegeleisen and Ferromanganese.

	First half of 1907.	Second half of 1907.	First half of 1908.
Pennsylvania	121,813	129,934	52,532
New Jersey, Maryland, Illinois and Colorado	50,862	36,739	32,961
Totals	172,675	166,673	85,493

The production of spiegeleisen alone in the first half of 1908 was 67,021 tons. Of ferromanganese alone the production in the first half of 1908 was 18,472 tons.

Building Furnaces.—On June 30, 1908, there were 24 furnaces in course of construction, of which 23 will use mineral fuel and 1 will use charcoal, as follows: New York, 2; Pennsylvania, 6; Ohio, 6; Indiana, 8; Illinois, 1, and Michigan, 1.

Rebuilding Furnaces.—On June 30, 1908, there were 17 furnaces being rebuilt, all mineral fuel, as follows: New Jersey, 1; Pennsylvania, 11; Alabama, 1; Ohio, 2, and Illinois, 2.

Steel mine cars are coming into use in some of the anthracite coal mines in Pennsylvania. An installation of 30 cars was made recently at the mines of the Clear Spring Coal Company, West Pittston. A car of the type adopted at these mines costs about twice as much as the average car of wood. The steel cars are introduced not so much with the idea that they will reduce the cost of mining as to keep the cost from increasing, as the companies have to go deeper and deeper for coal. The possible economy of the steel car is a question of the decrease in maintenance being sufficient to offset the increase in original cost.

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RICHARD R. WILLIAMS, - - - - - - - - - HARDWARE EDITOR.

Evolutions in Machine Tool Design.

Changes in the design of the more common machine tools, such as lathes, planers, milling machines, &c., are usually epidemical. By that is meant that in the same period the changes made in the different tools are of the same nature. Just before the introduction of high speed cutting tools there had been a lull, and apparently designs of all types of tools had settled down to a standard basis. But this condition was entirely upset when the limit of the capabilities of cutting tools was materially raised; pronounced activity was at once seen in a general redesigning for increased strength and power. In this the frames entered conspicuously, being stiffened here and there, and generally made heavier, while shafts were made larger, pulleys were adapted to wider belts, and steel was used more extensively in the parts most subject to strain. The last earlier epidemic took the form of an endeavor for greater convenience in the manipulation of machines, and particularly in feed drives where to do away with the laboriousness of hand changing of gears seemed to be the principal object.

Now the trend is to eliminate cone pulleys and the necessity of shifting belts. The success of change gear boxes in connection with feed drives suggested the line of development, and the direct cause was again the use of high speed tools since a greater range of driving speeds became imperative. For a time there was promise of meeting this need by the application of variable speed driving motors, and as these seemed to be successful it is difficult to explain the reaction that has now set in in favor of constant speed motors. True, they have constant maximum efficiency, whereas variable speed motors sacrifice something in their average efficiency to the speed range, but where constant speed motors are used speed variation must be obtained mechanically and gears and other transmissions providing variable speeds are sources of some loss in efficiency that may or may not equal the loss in variable speed motors. Constant speed motors cost somewhat less than variable speed motors, but the principal saving in installation expense is in the simpler controlling apparatus for the constant speed motor.

Whatever may be the cause, it is very evident that the driving of machines with a single constant speed belt pulley is at present very popular. One advantage is that since gears must be used anyhow, it is perfectly feasible to gear down from the driving speed to the spindle speed for even the fastest spindle speed, and more power can be delivered through a relatively large diameter pulley running at comparatively high speed. A lighter belt than is otherwise necessary will then do the work, and there is generally less wear on the driving parts. Often another advantage is the placing of the driving pulley in a more convenient location than is possible when it is directly mounted on the spindle.

The saving of time ordinarily lost in the shifting of belts was primarily the object of the single speed drive, but incidentally and not far remote is the advantage that, with the changing of speeds more easily accomplished, the operator will not neglect to make a change when the most efficient production of work requires it. The decision as to correct cutting speeds for a given material and given rates of feed, and their relation to one another, is no longer a matter of experiment or an individual's opinion, but more nearly an exact science, so that shop managers now know what results should be realized from the tools in use. Given this knowledge and it becomes highly desirable that machine tools be equipped with sufficient range of speeds and with small increments of variation to allow very closely approximating the most advantageous speed for the work in hand.

It would be difficult to foretell what will probably be the next important development in the design of machine tools, but the prediction may be ventured that it will be a more scientific study of what materials are the most suitable in the various parts, considering the element of strength for static members and friction as well as strength for all revolving and sliding parts. In the meantime machine tool builders will vie with one another in perfecting details such as wear adjustments, lubrication problems, safety devices, and the parts that make for what they are wont to call "foolproofness."

Modern Business Theories and Old Human Nature.

Occasionally a stray item drifts into the newspapers, particularly into the advertising columns, which has a strangely old-fashioned ring. It makes a direct or veiled bid for business on the ground that the service or the commodity may be secured for 15 to 20 per cent. less money than a year ago. We have noted, for instance, that some one unblushingly announces that he can put up a building at a substantial reduction from the cost of 1907. That is a selfish, individualistic course of procedure which is a defiance of the modern theories of doing business, which demand that all be treated alike; that the community at large and the buyer in particular suffers justly when the recognized standard of prices is ignored, and that the true method of restoring prosperity is to pay more for what is bought. If, as a buyer, you succumb to the temptation of paying less, you, as a seller, must ultimately accept less for what you in turn must market. A good many pleas for higher freight rates sound like this.

Orderly business demands stability of prices, to be determined by the seller, who pledges himself to keep them from soaring in boom times and is unalterably opposed to cutting in periods of adversity. Bitter experience has taught that it is a common error among business men that each believes himself to possess the monopoly of good judgment in buying. That fosters speculation and brings disaster. The idea must be particularly condemned, which has been prevalent among manufacturers, that they should follow their own devices in buying raw material. This is radically wrong. It diverts them from their true vocation of converting raw material into manufactured product. So long as they possess the assurance

from the seller of raw material that all are treated alike and that prices are stable, they should give grateful and loyal support to a beneficent institution. Stability of prices means stability of wages and of employment, and of maximum happiness and contentment to the maximum number. It narrows down competition, and makes what has been a fearful power of destruction a gently stimulating force. Yet an obstinate minority will persist in neglecting the general good and in hugging the belief in their own ability so long as human nature remains what it has been since the dawn of history.

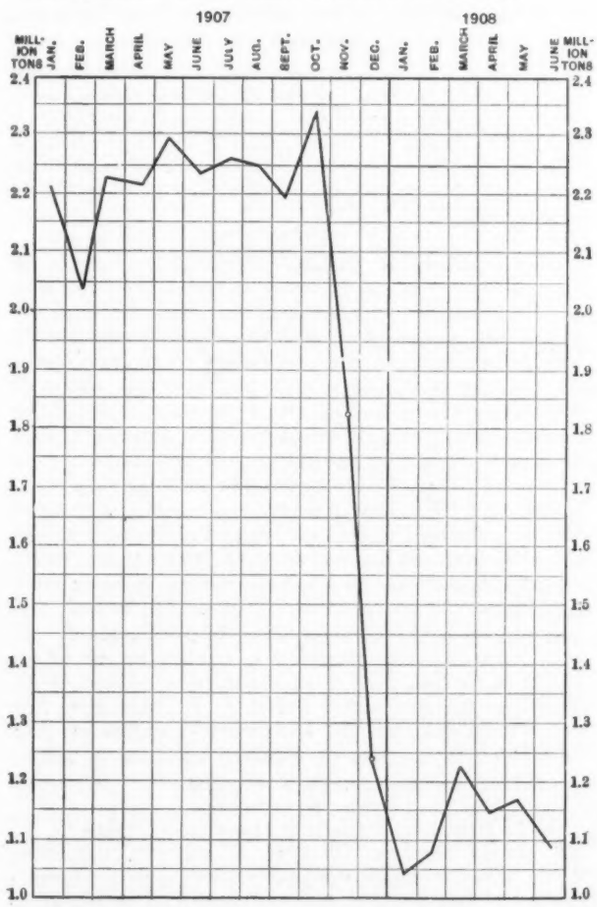
The Pig Iron Production Curve for 1908.

It is interesting to see how the diagram representing pig iron production in the first half of 1908 compares with that for the year 1907. We have already illustrated graphically (*The Iron Age* January 2, 1908, p. 73; February 6, p. 447) the plunge from the record production of October last year to the low records of December and January. Below we have plotted the figures for the past 18 months representing the production of coke and anthracite iron. The statistics are as follows:

Production of Coke and Anthracite Pig Iron by Months in 1907 *and* 1908.

	1907.	1908.
January	2,205,607	1,045,250
February	2,045,068	1,077,740
March	2,226,457	1,228,204
April	2,216,558	1,149,602
May	2,295,505	1,165,688
June	2,234,575	1,088,634
July	2,255,660	.....
August	2,250,410	.....
September	2,183,487	.....
October	2,336,972	.....
November	1,828,125	.....
December	1,234,279	.....

The plotting of the above figures is as follows:



The low point, it will be seen, was reached in January, the record for February, a month of 29 days, exceeding that for the 31 days of January. The high point this year was reached in March, and there was a decline in rate of production in each month since. Since our statistics are reported by months, we have chosen to make the plotted lines preserve the identity of each month. Thus May, a month of 31 days, shows a larger output than April, but the following table giving the daily rate of production shows that the March rate has not been touched since:

Daily Rate of Pig Iron Production.—Gross Tons.

January	33,718	April	38,289
February	37,163	May	37,603
March	39,619	June	36,287

From the number of furnaces that have been blown in this month it is quite probable that the July statistics will show that pig iron production has again taken a turn upward.

Is a Turn in Copper Due?

Larger purchases of copper by domestic consumers have created the impression that the era of low prices is over and that higher quotations will hereafter prevail. Before accepting this as correct, it may be well to consider a number of points having a bearing on the copper market. In analyzing the situation, several factors come prominently into view, among them the attitude of European bankers in hesitating to finance further shipments, and so curtailing the large exports to Europe; the probable stocks of metal in the world, and, what is more important, the consumptive demand in America.

It may be of interest to observe that the copper market has in the recent past shown three-year cycles of high and low prices almost as exactly as if obeying some uniform law. A fair price for both producer and consumer is generally accepted as 15 cents. According to the average prices which we have compiled, copper has sold under these figures more months than it has above them in the last 12 years. To be exact, in the 12 years ending with December, 1907, there were 77 months in which the average price of lake copper, as given in the reports in *The Iron Age*, was below 15 cents, while in 67 months during that period the average quotations were above 15 cents. This course of cycles, however, did not hold true for a few years previous to 1896, when there was an era of low prices in all commodities. Taking the recent course of the copper market, however, there were over two and a half years of high prices ending with September, 1907, and since then there has been less than a year of copper under 15 cents. The reason for this is not hard to find, when it is realized that when copper sells above 15 cents it stimulates production all over the world, but copper must decline to considerably below 13 cents before production is curtailed. In other words, the operating costs are such that, with many mines, shutting down at 12, 11 and even 10 cents per pound as a selling price for copper would be more expensive than to continue mining and selling the product at a loss. Then, too, there are many properties whose cost of production is below 10 cents per pound.

The mainstay of the copper market for months has been the heavy shipments to Europe. Since copper prices declined to 15 cents, in October, 1907, there have been shipped from American ports over 265,000 tons. This is more than was ever before exported in a year. Much of this metal has been financed in Europe, where the process of making collateral loans is much simpler than in America, and the owner of the metal receives advances for practically its full value. European bankers are now discriminating against these finance bills for copper, and exports are lighter, but those in a position to take a

broad view point out that whenever a heavy export movement to Europe has occurred, as in this year, the European market continues to absorb about the same quantities. This is largely due to the fact that with low-priced copper new uses are found for the metal which continue even after the price has gone back to higher figures. This was well illustrated in 1904, when exports were, to that date, the heaviest on record, and prices were then only slightly recovering from the depression of 1902. In the following year exports were likewise large. This furnishes an excellent argument for those who claim that the exports to Europe will not shrink seriously, even if bankers do discriminate against purely speculative purchases.

Another argument advanced for the continuance of exports at a good figure, although not at the past high record, is that European manufacturers make a practice of accumulating copper at low figures and putting it into their warehouses to be used only when the market advances sharply. It is known that this stock, which is rated as the invisible supply, was largely drawn on in the closing months of 1906 and the early months of 1907, for in each of those months exports fell off to below 18,000 tons, with but a single exception. It is claimed that the quantities sent out during the last nine months above 18,000 or 20,000 tons monthly were to replace this invisible supply, thus accumulating new stocks, and the opinion is advanced that there will be a continuance of these heavy shipments to Europe.

The real upturn to the copper market can scarcely come until American consumers buy much more freely. These consumers have for months been working off their old stocks, which are now down to almost nothing. They, too, will need to replace their invisible supply, but until an active demand for copper products comes about the buoyant market so long hoped for is scarcely possible. Copper was the first to feel the effects of a runaway market, the first to decline and by the same analogy should be the first to advance. The high prices of 1906 and 1907 may have been brought about by the electrification of existing steam railroad lines, of which several projects were then under way, added to the already heavy consumption of copper in general. With the return of prosperity to the railroads, other schemes of this character will develop and more additions to the existing 42,000 miles of electric urban and suburban railroads will surely be made. There is promise of a speedier return to new construction of this character than any other, and one reason for it apparently is the fact that during the past months of depression the earnings of such railroads have not fallen off anywhere near the proportion that the earnings of steam railroads have shown.

The Position of the "Baby" Bessemer.

The "baby" Bessemer makes a rather pitiable showing in the statistics of production issued by the American Iron and Steel Association. It appears that in 1907 there were made by the Tropenas process in 17 plants 13,140 tons of steel, while other modifications of the Bessemer process produced 19,317 tons, or a total of 32,457 tons. It appears that the annual capacity of the "baby" Bessemer plants increased from 74,600 tons in June, 1904, to 179,200 tons in November, 1907, which would indicate that the production is very intermittent. To base on the increased number of these little pots, the statement that "the growth of our steel industry in the last few years has been almost wholly in the use of the Tropenas and other modifications of the standard Bessemer process," as does the report of the American Iron and Steel Association, is giving the "baby" Bessemer a position which it has not earned.

As a matter of fact, the "baby" Bessemer has fallen behind relatively as a method of making steel castings, and the open hearth has forged ahead enormously. The production of open hearth steel castings was 400,348 tons in 1903. It dropped to 302,834 tons in 1904, rose to 526,540 tons in 1905, jumped to 719,891 tons in 1906, and reached 746,525 tons in 1907. It looks as though the "baby" Bessemer would remain an infant forever.

The Standard Oil Decision.

The United States Court of Appeals, in the decision at Chicago last week in the Standard Oil case, has thrown light on a portion of the Elkins law that has given considerable concern to the shippers of the country, especially to those whose traffic affairs are large and complex. The fine of $29,240,000 which had been recorded against the Standard Oil Company of Indiana was annulled on the ground that the trial court had made three important errors, as follows: That the amount was excessive, being more than the actual assets of the defendant company; that each car shipped at the rate claimed to be illegal should not have been counted as a separate offense, and that the trial court adopted too strict a view of the duty of the shipper in the instructions to the jury on the question of "intent." The question of "intent" was held to be the fundamental point involved in the case.

The company paid, in monthly settlements with the auditor of the Alton Railroad, a rate of 6 cents from Whiting, Ind., to East St. Louis, but it was charged that the only rate on file with the Interstate Commerce Commission was 18 cents. The traffic manager of the company had testified that he supposed 6 cents was the legal rate, and that he had never heard of the 18-cent rate, and knew nothing of such a rate, he having been informed by the chief tariff clerk of the Alton that the 6-cent rate was a legal tariff, filed with the commission. Judge Landis had instructed the jury that "the proof need not establish the fact that the defendant had actual knowledge of the lawful rate." The jurors were instructed to bring in a verdict of guilty if they found that a diligent effort by the defendant, made in good faith, would have discovered the 18-cent rate which was held to be the lawful rate.

The Institute of Metals.—The first meeting of the Interim Council of the Institute of Metals was held July 8 in London, when over 200 members were elected, which undoubtedly compares most favorably with any similar society only in existence one month. The subscription for members is 2 guineas (£2 2s.), and for students 1 guinea. No entrance fees are to be charged for either members or students this year, but after January 1, 1909, an entrance fee of 2 guineas will be charged for members and 1 guinea for students. The next meeting of the Council will take place in September, when it is expected that the rules will be finally fixed and some definite move taken as to appointing a permanent secretary and selecting suitable offices. Such rapid progress is being made that a general meeting, at which papers will be read, will probably be held next November in Birmingham. All communications with reference to reading papers or applications for membership of the institute should be addressed to the secretaries, Dr. H. C. H. Carpenter, Professor of Metallurgy, the University, Manchester, England; Wm. H. Johnson of Johnson, Clapham & Morris, Ltd., 24 and 26 Lever street, Manchester.

L. L. Hurwitz, of Davis & Hurwitz, Syracuse, N. Y., and Morris Hurwitz, of Allan & Hurwitz, Rochester, N. Y., have purchased the business of Davis & Hurwitz and L. J. Davis which they will continue at the same location under the name of the Hurwitz Bros. Iron & Metal Company. The firm is a wholesale dealer in scrap iron and metals.

Steel and Iron Finished Products Made in the United States in 1907.

The following statistical information is taken from the annual report for 1907 of the American Iron and Steel Association, all tons being gross tons of 2240 lb.:

Production of All Kinds of Steel.

In 1907 there were 234 works which made steel ingots or castings, against 213 works in 1906. Of the total active works in 1907 there were 86 which made steel ingots, but not steel castings, 119 works which made steel castings, but not steel ingots, and 29 works which made both steel ingots and castings. The following table gives the production of all kinds of steel ingots and castings in 1907, compared with the total for the three previous years:

States.—Gross tons.	Bessemer.	Open hearth.	Crucible and all other.	Total ingots and castings.
Massachusetts, Rhode Island and Connecticut	1,421	239,797	3,980	245,198
New York and New Jersey	858,681	706,019	37,969	1,602,669
Pennsylvania	4,351,841	7,868,353	88,750	12,308,944
Del., Md., Dist. of Columbia, Va., West Va., Ky., Ga. and Ala.	840,865	412,653	1,900	1,255,421
Ohio	3,636,679	819,642	1,690	4,458,0 1
Indiana and Illinois	1,723,073	1,194,913	6,251	2,924,237
Mich., Wis., Minn, Missouri, Iowa, Colorado, California and Oregon	254,989	308,356	4,769	568,114
Totals for 1907	11,667,549	11,549,736	145,309	23,362,594
Totals for 1906	12,275,830	10,980,413	141,893	23,398,136
Totals for 1905	10,941,375	8,971,376	111,196	20,023,947
Totals for 1904	7,859,140	5,908,166	92,581	13,859,887

Production of All Kinds of Steel Ingots.

The following table gives the production of steel ingots by States, all direct castings being omitted:

States.—Gross tons.	Bessemer ingots.	Open hearth ingots.	Crucible and all other.	Total ingots. Gross tons.
Mass., R. I., Conn., N. Y. and N. J.	852,103	845,607	28,049	1,725,759
Pennsylvania	4,345,486	7,559,421	86,957	11,991,864
Md., D. of C., W. Va., Ky., Ga., Ala.	838,190	401,881	1,900	1,241,971
Ohio	3,633,073	718,962	90	4,351,225
Ind., Ill., Colorado and California	1,965,424	1,278,240	4,994	3,248,658
Totals for 1907	11,634,276	10,803,211	121,990	22 559,477
Totals for 1906	12,243,229	10,260,522	120,680	22,624,431
Totals for 1905	10,919,272	8,444,836	99,072	19,463,180
Totals for 1904	7,843,089	5,605,332	81,255	13,529,676
Totals for 1903	8,574,730	5,429,563	100,420	14,104,713

Production of All Kinds of Steel Castings.

The following table gives by States the production of all kinds of direct steel castings:

States.—Gross tons.	Bessemer.	Open hearth.	Crucible and all other.	Total. Gross tons.
Mass., Conn., New York and New Jersey	7,999	100,209	13,900	122,108
Pennsylvania	6,355	308,932	1,793	317 0*0
Del., Dist. of Col., Va., Ala. and Ohio	6,281	112,355	1,600	120,236
Indiana, Ill. and Mich.	6,108	157,284	2,865	166,257
Wis., Minn., Mo., Iowa, Colo., Ore., Cal.	6,530	67,745	3,161	77,436
Totals for 1907	33,273	746,525	23,319	803,117
Totals for 1906	32,601	719,891	21,213	773,705
Totals for 1905	22,103	526,540	12,124	560,767
Totals for 1904	16,051	302,834	11,326	330,211
Totals for 1903	18,099	400,348	11,818	430,265

Production of All Kinds of Rails.

The production of all kinds of rails in 1907 amounted to 3,633,654 tons, against 3,977,887 tons in 1906, a decrease of 344,233 tons, or over 8.6 per cent. The maximum production was reached in 1906. The year of next largest production was 1907. Rails rolled from purchased blooms, crop ends and "seconds," and rerolled, or renewed, rails are included. Renewed rails are rails that have been in use and after reheating are rolled down to small sections. In the following table the production of all kinds of rails in 1907 is given by States, followed by the annual production since 1903:

States.—Gross tons.	Bessemer.	Open hearth.	Iron.	Total.
Pennsylvania	1,093,932	36,837	...	1,130,769
Other States	2,286,093	215,867	925	2,502,885
Totals for 1907	3,380,025	252,704	925	3,633,654
Totals for 1906	3,791,459	186,413	15	3,977,887
Totals for 1905	3,192,347	183,264	318	3,375,929
Totals for 1904	2,137,957	145,883	871	2,284,711
Totals for 1903	2,946,756	45,054	667	2,992,477

Twenty-six works in 13 States rolled or rerolled rails in 1907, as follows: New York, 1; Pennsylvania, 6; Maryland, 2; West Virginia, 2; Tennessee, 1; Georgia, 1; Alabama, 2; Ohio, 4; Indiana, 1; Illinois, 3; Wisconsin, 1; Colorado, 1, and Washington, 1.

Production of Bessemer Steel Rails.

The following table gives the production of Bessemer steel rails by States from 1904 to 1907:

Gross tons.	1904.	1905.	1906.	1907.
Pennsylvania	801,657	1,097,154	1,298,409	1,093,932
Other States	1,336,300	2,095,193	2,493,050	2,286,093
Totals	2,137,957	3,192,347	3,791,459	3,380,025

Production of Open Hearth Steel and Iron Rails.

The production of open hearth steel rails in 1907 was 252,704 tons, against 186,413 tons in 1906, 183,264 tons in 1905, 145,883 tons in 1904, and 45,054 tons in 1903. The increase in production in 1907 over 1906 was 66,291 tons. The maximum production was reached in 1907. Alabama made over 59 per cent. of the open hearth rails that were rolled in 1907, Colorado, Pennsylvania, Georgia and New York rolling the remainder in the order named. In 1906 Alabama rolled over 84 per cent.

The production of iron rails in 1907 was 925 tons, all rolled in Tennessee and Illinois, and all weighing less than 45 lb. to the yard. In 1906 the production of iron rails was 15 tons and in 1905 it was 318 tons. The maximum production of iron rails was reached in 1872, when 808,866 tons were rolled.

Weight of All Kinds of Rails.

The following table gives the production of all kinds of rails from 1903 to 1907, according to the weight of the rails per yard. Street and trolley rails are included in the total production.

Kind of rails.—Gross tons.	Under 45 lb.	45 lb. and less than 85.	85 lb. and over.	Total. Gross tons.
Bessemer rails	279,004	1,407,490	1,693,531	3,380,025
Open hearth rails	15,909	162,495	74,300	252,704
Iron rails	925	.....	.....	925
Totals for 1907	295,838	1,569,985	1,767,831	3,633,654
Totals for 1906	284,612	1,749,650	1,943,625	3,977,887
Totals for 1905	228,252	1,601,624	1,546,053	3,375,929
Totals for 1904	291,883	1,320,677	672,151	2,284,711
Totals for 1903	221,262	1,603,088	1,168,127	2,992,477

In addition to the rails rolled in 1907 we imported 3752 tons of iron and steel rails in that year. During the same year we exported 338,906 tons. In 1906 our exports of rails amounted to 328,036 tons, and our imports to 4943 tons, virtually all steel.

Production of Structural Shapes.

Our statistics of iron and steel structural shapes embrace the production of beams, beam girders, zee bars, tees, channels, angles, and other structural forms, but they do not include plates or girders made from plates. Plates are provided for under other classifications, and all plates cut to specifications are included in the general statistics of plates.

The total production of strictly structural shapes in 1907 was 1,940,352 tons, against 2,118,772 tons in 1906, a decrease of 178,420 tons, or over 8.4 per cent. Of the total production in 1907 about 1,936,379 tons were rolled from steel and about 3973 tons from iron, against about 2,114,053 tons rolled from steel and about 4719 tons rolled from iron in 1906. The maximum production of structural shapes was reached in 1906. The year of next largest production was 1907. The production of structural shapes in 1906 and 1907 by States was as follows:

States.—Gross tons.	1906.	1907.
New York and New Jersey	165,684	181,677
Pennsylvania	1,673,115	1,458,507
Alabama and Ohio	63,983	47,074
Indiana, Illinois, Wisconsin, Colorado and California	215,990	253,094
Totals	2,118,772	1,940,352

In 1907 there were 37 works which rolled structural shapes, against 40 works in 1906.

The following table gives the production of structural shapes from 1903 to 1907:

Years.	Gross tons.	Years.	Gross tons.
1903	1,095,813	1906	2,118,772
1904	949,146	1907	1,940,352
1905	1,660,519		

Production of Wire Rods.

The total production of iron and steel wire rods in 1907 amounted to 2,017,583 gross tons, against 1,871,614

tons in 1906, an increase of 145,969 tons, or over 7.7 per cent. Of the total production in 1907 2,016,033 tons were steel rods and 1550 tons were iron rods. In 1906 the steel wire rods rolled amounted to 1,870,413 tons and the iron rods to 1201 tons. The maximum production of wire rods was reached in 1907. The year of next largest production was 1906. In 1907 there were 29 works which rolled wire rods, against 30 works in 1906. The following table gives the production by States since 1904:

States.—Gross tons.	1904.	1905.	1906.	1907.
Mass., Conn., R. I., N. Y. and N. J.	228,289	249,835	236,380	233,687
Pa., Ky., Ga., Ala. and Ohio	973,801	1,038,212	1,102,365	1,176,278
Indiana, Ill., and Colo.	496,938	520,641	532,869	607,618
Totals	1,699,028	1,808,688	1,871,614	2,017,583

In 1907 Pennsylvania rolled over 31.5 per cent. of the total for the whole country. The following table gives the total production of iron and steel wire rods from 1903 to 1907:

Years.	Tons.	Years.	Tons.
1903	1,503,455	1906	1,871,614
1904	1,699,028	1907	2,017,583
1905	1,808,688		

Production of Plates and Sheets.

The production of iron and steel plates and sheets in 1907, excluding nail plate, was 4,248,832 tons, against 4,182,156 tons in 1906, an increase of 66,676 tons. The following table gives the production by States of plates and sheets since 1905:

States.—Gross tons.	1905.	1906.	1907.
New England, New York and New Jersey	76,197	124,725	126,403
Pennsylvania	2,308,389	2,624,284	2,651,166
Del., Maryland and Virginia	28,481	25,500	28,420
West Virginia	93,586	148,684	153,599
Kentucky and Alabama	47,303	51,642	54,631
Ohio	688,633	818,769	851,987
Ind., Ill., Missouri, Wyoming and California	289,641	388,552	382,626
Totals	3,532,230	4,182,156	4,248,832

One hundred and thirty-four works in 17 States rolled plates or sheets in 1907, against 134 works in 16 States in 1906.

The total production of iron and steel plates and sheets, not including nail plate or skelp, from 1903 to 1907 is given below:

Years.	Tons.	Years.	Tons.
1903	2,599,665	1906	4,182,156
1904	2,421,398	1907	4,248,832
1905	3,532,230		

At the request of the manufacturers we have separated for 1905, 1906, and 1907 the production of iron and steel plates of No. 12 gauge and thicker from the production of iron and steel sheets of No. 13 gauge and thinner, classifying the former as plates and the latter as sheets. Black plates, or sheets, for tinning are included, but nail plate and skelp are excluded. As shown by the following table there was a steady growth in the production of iron plates from 1905 to 1907, but a continuous decline in the production of iron sheets:

Years.	Plates.—No. 12 and thicker.			Sheets.—No. 13 and thinner.		
Gr'ss tons.	Iron.	Steel.	Total.	Iron.	Steel.	Total.
1905	10,022	2,031,184	2,041,206	62,134	1,428,890	1,491,024
1906	23,333	2,508,219	2,531,552	51,040	1,599,564	1,650,604
1907	30,277	2,629,783	2,660,060	43,761	1,545,011	1,588,772

Of the total production of iron and steel plates in 1907 Pennsylvania rolled 2,005,403 tons, or over 75.3 per cent., against 1,917,045 tons, or over 75.7 per cent., in 1906. Of the total production of iron and steel sheets in 1907 Pennsylvania rolled 645,763 tons, or over 40.6 per cent., against 707,239 tons in 1906, and Ohio rolled 571,317 tons in 1907, or over 35.9 per cent., against 544,456 tons in 1906. In 1907 there were 36 works which rolled plates but did not roll sheets, 64 works which rolled sheets but did not roll plates, and 34 works which rolled both plates and sheets. Nail plate works are not included.

Production of Black Plates, or Sheets, for Tinning.

The production of black plates, or sheets, for tinning in 1907, which is included in the preceding tables, amounted to 504,072 tons, against 576,079 tons in 1906, a decrease of 72,007 tons, or almost 12.5 per cent. Of the total production in 1907 Pennsylvania made over 50.3 per cent., against over 54.3 per cent. in 1906. Ohio, West Virginia, Indiana, Maryland, and Illinois also made black plates, or sheets, for tinning in 1907 in the order named. Of the total production of black plates, or sheets, for tinning in 1907, about 3161 tons were rolled from iron and about 500,911 tons were rolled from steel, while in 1906 about 5666 tons were rolled from iron and about 570,413 tons from steel.

The following table gives the production by States of black plates, or sheets, for tinning in the last four year:

States.—Gross tons.	1904.	1905.	1906.	1907.
Pennsylvania	252,527	256,329	312,977	253,807
Maryland and West Virginia	54,360	69,180	94,076	95,939
Ohio, Ind., Ill. and Mo.	165,682	182,078	169,026	154,326
Totals	472,569	507,587	576,079	504,072

Production of Tin Plates and Terne Plates.

We estimate the production of tin plates and terne plates in 1907 as amounting to 1,153,097,000 lb., or 514,775 gross tons, as compared with 1,293,740,000 lb., or 577,562 tons, in 1906, a decrease of 140,643,000 lb., or 62,787 tons.

The following table gives the production of tin plates and terne plates in the United States from 1904 to 1907. For the census year 1904 the statistics were collected by the Bureau of the Census:

Year.—Pounds.	Tin plates.	Terne plates.	Total pounds.
1904 (census year ending December 31)	867,526,985	158,857,866	1,026,384,851
1905 (calendar year).	.....	.....	1,105,440,000
1906	1,100,373,000	193,367,000	1,293,740,000
1907	996,650,000	156,447,000	1,153,097,000

Of the total production of tin plates and terne plates in 1907 about 996,650,000 lb., or 444,933 gross tons, were tin plates and about 156,447,000 lb., or 69,842 tons, were terne plates. As compared with 1906 there was a decrease in tin plates of 103,723,000 lb., and in terne plates of 36,920,000 lb.

Production of Nail Plate.

The production of iron and steel nail plate in 1907 was 52,027 tons, against 54,211 tons in 1906, a decrease of 2184 tons, or over 4 per cent. Of the total production in 1907 about 36,932 tons were steel and about 15,095 tons were iron, against about 37,032 tons of steel and about 17,179 tons of iron in 1906, a decrease in steel nail plate of 100 tons and in iron nail plate of 2084 tons. Spike plates are included.

Production of Miscellaneous Rolled Products.

The following table gives the production by States in 1906 and 1907 of merchant bars, skelp, spike rods, bolt rods, splice bars, hoops, bands, cotton ties, strips, rolled axles, rolled armor plate, and other forms of finished rolled iron and steel for which statistics have not already been given. Rolled forging blooms and forging billets are also included for both years. Forged armor plate, hammered axles, and other forgings are not, however, included:

States.—Gross tons.	1906.	1907.
Maine and Massachusetts	40,602	41,961
Rhode Island and Connecticut	86,561	100,631
New York	271,528	289,105
New Jersey	98,652	99,176
Pennsylvania	3,792,666	4,173,235
Delaware and Maryland	26,000	28,245
Virginia	35,852	30,211
West Virginia	192,579	254,554
Kentucky, Tennessee, Ga. and Texas	62,079	67,114
Alabama	125,022	91,376
Ohio	1,246,615	1,397,514
Indiana	294,338	282,065
Illinois	669,683	686,413
Michigan	88,025	91,674
Wisconsin	175,646	173,579
Missour	64,658	75,610
Colorado and Wyoming	66,303	62,483
Washington, Oregon and California	47,019	47,428
Totals	7,383,828	7,972,374

Of the products enumerated above about 5,867,869 tons were steel and about 2,104,505 tons were iron in 1907, as compared with 5,294,758 tons of steel and 2,089,070 tons of iron in 1906, showing an increase in steel products of 573,111 tons and in iron products of 15,435 tons, a total increase of 588,546 tons.

The following table gives separately the production in 1907 of merchant bars, skelp, splice bars, hoops, bands, cotton ties, and other miscellaneous forms of finished rolled iron and steel. The production of rolled forging

blooms and rolled forging billets is included for 1905 and subsequent years:

Products in 1907.—Gross tons.	Iron.	Steel.	Total.
Merchant bars—all kinds and sizes.	1,440,356	2,530,632	3,970,988
Skelp, flue and pipe iron or steel	444,536	1,358,091	1,802,627
Splice bars	10,115	183,108	193,223
Hoops	.....	200,168	200,168
Bands and cotton ties	4,650	469,529	474,179
Rolled forging blooms and forging billets	691	227,091	227,782
Spike and chain rods, bolt and nut rods, horseshoe bars, strips, shovel blanks, shovel bars, blanks for seamless tubes, railroad ties, rail joints, and all other miscellaneous finished rolled forms not above enumerated	204,157	899,250	1,103,407
Totals for 1907	2,104,505	5,867,869	7,972,374
Totals for 1906	2,089,070	5,294,758	7,383,828
Totals for 1905	1,950,546	4,447,561	6,398,107
Totals for 1904	1,662,896	2,934,601	4,597,497

Production of Rolled Iron and Steel Compared.

The following table gives the production in gross tons of all leading articles of finished rolled steel in 1907, as compared with the production of all leading articles of finished rolled iron. All miscellaneous rolled products are included:

Products in 1907.—Gross tons.	Iron.	Steel.	Total.
Rails	925	3,632,729	3,633,654
Structural shapes	3,973	1,936,379	1,940,352
Plates and sheets	74,038	4,174,794	4,248,832
Nail plate	15,095	36,932	52,027
Wire rods	1,550	2,016,033	2,017,583
Rolled forging blooms and forging billets	691	227,091	227,782
Merchant bars	1,440,356	2,530,632	3,970,988
Skelp	444,536	1,358,091	1,802,627
Splice bars	10,115	183,108	193,223
Hoops	.....	200,168	200,168
Bands and cotton ties	4,650	469,529	474,179
All other finished rolled	204,157	899,250	1,103,407
Totals for 1907	2,200,086	17,664,736	19,864,822
Totals for 1906	2,186,557	17,401,911	19,588,468
Totals for 1905	2,059,990	14,780,025	16,840,015
Totals for 1904	1,760,084	10,253,297	12,013,381

Production of All Kinds of Rolled Iron and Steel.

By the phrase rolled iron and steel we include all iron and steel rolled into finished forms. Forged armor plate, hammered axles, and other forgings are not included, nor such intermediate rolled forms as muck bars, slabs, blooms, billets, tin plate and sheet bars, &c. Rolled forging blooms and rolled forging billets are, however, included for 1905 and subsequent years. The following table gives the total production by States of all kinds of finished rolled iron and steel for 1906 and 1907, according to their geographical position:

States.—Gross tons.	1906.	1907.
Maine and Massachusetts	170,967	166,617
Rhode Island and Connecticut	124,954	120,659
New York	1,228,293	1,267,121
New Jersey	179,220	179,686
Pennsylvania	10,036,639	10,081,956
Delaware	18,800	25,415
Maryland	430,546	426,673
Virginia	37,852	32,211
West Virginia	363,589	421,704
Kentucky	106,675	130,069
Tennessee, Georgia and Texas	46,725	62,753
Alabama	326,588	283,297
Ohio	2,979,367	2,975,137
Indiana	604,317	569,146
Illinois	2,131,517	2,246,274
Michigan	88,025	91,674
Wisconsin	242,679	251,533
Missouri	79,385	90,360
Colorado and Washington	348,079	395,379
Kan., Wy., Ore. and Cal	44,251	47,158
Totals	19,588,468	19,864,822

Twenty-seven States rolled iron or steel or both iron and steel in 1907, against the same number in 1906. Pennsylvania made over 50.7 per cent. of the total rolled production in 1907.

Active Rolling Mills and Steel Works.

In 1907 there were 522 works in 29 States and the District of Columbia which made steel ingots or castings or rolled iron or steel into finished forms, against 501 similar works in 28 States and the District of Columbia in 1906, a gain of 21 works. Of the total in 1907 there were 383 works which rolled iron or steel into finished forms and 139 works which made steel ingots or castings but not finished forms of rolled iron or steel. Rolled forging blooms and forging billets are classified as finished products.

Production of Allegheny County, Pennsylvania.

The following table gives the number of blast furnaces and completed rolling mills and steel works and the production of pig iron, steel ingots and castings, rails, structural shapes, plates and sheets, miscellaneous rolled products, and all finished rolled iron and steel in Allegheny County, Pa., from 1905. Rolled forging blooms and rolled forging billets are included:

Details.—Gross tons.	1905.	1906.	1907.
Furnaces built and building, No.	42	47	47
Production of pig iron	5,410,890	5,702,721	5,438,233
Rolling mills and steel works, No.	65	67	66
Production of Bessemer steel	3,137,883	3,255,064	2,972,286
Production of open hearth steel	3,410,482	3,799,907	3,883,014
Production of all other steel	44,752	50,530	50,290
Total production of steel	6,593.117	7,105,501	6,905,590
Production of all kinds of rails	743,612	851,419	770,333
Production of structural shapes	881,932	1,054,747	889,066
Production of plates and sheets	1,232,705	1,300,873	1,346,517
Production of other rolled products	2,212,322	2,478,978	2,632,314
Production of all rolled products	5,070,571	5,686,017	5,638,230

Sherardizing Practice.

BY J. EVERETT THOMPSON.

Apropos of the article in *The Iron Age* of July 23 on the "Deposition of Zinc for Protecting Iron and Steel Surfaces," some data may be of interest derived from experience with Sherardizing in the United States. As a method of rust proofing Sherardizing is far superior to any other existing process of galvanizing. It is applicable not only in all cases where hot or cold galvanizing can be used, but also in numberless cases where they can not.

The great importance of Sherardizing consists in the fact that, in addition to a surface coating of zinc, an infinitesimal quantity of zinc is alloyed into the iron or steel and forms in itself a rust proofing that resists corrosion. There is a point to be noted in comparing it with hot galvanizing. In the case of the latter, if by means of some pinhole or otherwise, the coating were pierced down to the iron or steel of the article, a rusting action is set up which in time creeps between the galvanized coating and the pure metal of the article, making the former peel off. In the case of the Sherardized coating such a pinhole would probably only go down to the alloy, and no rusting action would take place. But even if it went deeper still there would be no possibility of rusting action.

In many cases the articles need no special cleaning before being Sherardized. In others they are cleaned, as is done for ordinary galvanizing. Bolts, nuts, screws, stampings, bright plates, wire goods, etc., may be Sherardized just as they come from the machines without any further preparation or cleaning. Articles coated with grease or oil receive as good a coating of zinc as those which are free from it, if not better.

The Method.

The articles to be Sherardized are packed in a closed drum or bar in contact with the ordinary zinc of commerce. The drum is placed in an oven and heated to a temperature of about 700 degrees F. for 4 or 5 hr. It is then withdrawn and allowed to cool down to a temperature convenient for handling, when its contents are dumped upon a screen or grating which allows the zinc dust to fall through into a chamber below, from which it is drawn for use again. The cycle of operation is so simple that the most ordinary class of unskilled labor can be employed without fear as to the results.

Advantages.

By the gradual heating up, and then the gradual cooling down, the zinc dust being a poor conductor of heat, there can be no sudden high temperature, as contrasted with the plunge of an article into the molten zinc, and then its sudden cooling. The extreme evenness of the coating in practice means that, however thick it may be, the sharpness of screw threads or the shape of stamped letters is preserved, and if sufficient clearance has been given, a Sherardized nut will run on a Sherardized bolt as easily and as smoothly as if it were not Sherardized, no recutting being required. Articles Sherardized and buffed may be used instead of polished brass or nickel plating. Since the protective coating is in the surface and not on it, it does not peel off as plating does. Sherardized plumbers' supplies are unequaled as to beauty of finish and length of life. In marine construction Sherardized metal ranks next to solid copper and brass in its ability to withstand corrosion. Chains treated with this process have remained in sea water continuously for nine months without showing any signs of corrosion.

Alaska Tin Values Yet to Be Proved.

WASHINGTON, D. C., July 27, 1908.—The tin deposits of Alaska have been subjected to an exhaustive investigation by the United States Geological Survey in the past year, and a bulletin is soon to be published, to be followed by an elaborate report. The York tin deposits were examined by A. J. Collier in 1903 and 1904 and by F. L. Hess in 1905, and the summaries of their reports have heretofore appeared in *The Iron Age*. Of Mr. Hess' report a liberal synopsis was given in *The Iron Age* of May 31, 1906, page 1742. In view of the extensive development work in progress and of the fact that the earlier examinations had been limited on account of lack of time, Adolph Knopf of the Survey staff was instructed to examine all known occurrences of tin in the so-called Seward Peninsula. His preliminary report covers much of the same ground gone over by Mr. Hess in reporting on the York District. Of the four localities now being prospected, Buck Creek, Cape Mountain and Lost River are in the York territory, while Ear Mountain is isolated, being in the northwestern part of the peninsula, in latitude 66° north, longitude 166° west. The only cassiterite Mr. Knopf obtained from Ear Mountain was stream tin from Eldorado Creek. No tin ore in place could be seen. The conclusions stated in the report are as follows:

The Alaskan lode tin deposits are associated with granite intrusives. The ore occurs in a variety of ways:

1. In highly altered quartz porphyry dikes.
2. In tourmalinized margins of granite masses and granitic dikes.
3. In contact metamorphic deposits.
4. In quartz stringers cutting slates and limestones.
5. In quartz veins cutting granite and accompanied by impregnation of the adjoining granite.
6. In beds of actnolite rock interstratified with slates.

Inasmuch as the granite intrusives have in many places profoundly modified the sedimentary rocks surrounding and enveloping them with the production of numerous unusual and heavy minerals, it has happened that the contact metamorphic deposits have received the most attention. This tendency to regard the contacts as favorable ore horizons has been strengthened partly by the fact that some rich masses of tin ore have been found near tourmalinized limestone, and partly by the deceptive resemblance which the heavy contact minerals, such as garnet, bear to cassiterite. The chances of finding workable tin mines in deposits of this type are, however, extremely slight. Quartz porphyry dikes, locally known as lodes or even as quartz veins, have received considerable attention owing to the fact that the original discovery of lode tin in Alaska was made on a highly altered dike of this character. The unwelcome fact should be speedily realized that few of these dikes hold out any inducements whatever as prospective tin producers. Of the other types of occurrence, some of which are of promising character, it can be said that, from the point of view of the conservative mining man, their value remains yet to be proved.

Developments throughout the region are, for the most part, still in the prospecting stage. Many of the open cuts have not reached solid bed rock. No tonnage of ore, with one exception, on Lost River, has yet been blocked out. It follows that on account of inadequate development no data are available for a safe estimate of the future commercial importance of the Alaska tin deposits. The region is plainly not "a poor man's country," but appears to offer a limited field for cautious exploration by capital. The placer deposits from Buck Creek have so far supplied the bulk of the Alaskan tin. W. L. C.

Tin in the United States in 1907.

In an advance chapter of Mineral Resources of the United States, calendar year 1907, Frank L. Hess of the United States Geological Survey discusses the world's production of tin and briefly describes the various deposits in the United States and Alaska. The total commercial output of all these domestic deposits amounted in 1907 to only 62 tons, although small additional amounts were produced in an experimental way and some low grade tin ore was reported as mined and left on the dumps. The consumption in the United States is from 40,000 to 50,000 tons a year, or 35 to 40 per cent. of the world's production. Commenting on the waste of tin with reference to the world's small visible supply, Mr. Hess says:

The recovery of tin from scrap, dross, type metal, babbitt and other friction metals, bronze, &c., is growing, and should grow even faster. The amount of tin wasted in tin cans that have been used and thrown away and in the solder used on them is very great and is an extravagance which from a broad economic view is deplorable. Although the amount of tin ores to be drawn upon cannot be as accurately measured as the coal deposits of the world, their exhaustion is as certain, and unless some now unrecognized substitute for tin is found, such as an economical method for the production of aluminum from clay might give, such saving will become compulsory. During the year 16 companies in the United States recovered tin amounting to 1662 net tons, valued at $914,404, while a large but unknown recovery of tin from secondary sources was also made in Europe.

Customs Decisions.

Fish Hooks.

The Board of United States General Appraisers has declined to reverse the assessment of duty levied by Collector Fowler on importations of fish hooks entered by Abbey & Imbrie and J. W. Hampton, Jr., & Co., New York. The duty was assessed at the rate of 40 per cent. plus 1¼ cents per pound under the provisions of paragraph 137 of the tariff act. The importers claimed in their protests that the wire from which the hooks are made is valued at not more than 4 cents per pound, and that the hooks are therefore dutiable according to the gauge of the wire as provided in the first part of paragraph 137, with the addition of 1¼ cents per pound prescribed in the second proviso of the same paragraph. In overruling the protests, General Appraiser Howell says that the importers failed to offer any evidence, and that there is nothing in the papers in the case to warrant the board in disturbing the finding of the appraising officers that the wire used in the manufacture of the fish hooks is valued at more than 4 cents per pound.

Cylindrical Steel Gas Tanks.

The Board of General Appraisers has sustained protests filed by the Liquid Carbonic Company, Chicago. The Circuit Court of Appeals recently upheld the contention of the importers and the Government has announced its acquiescence. These protests relate to steel cylinders designed for use in the transportation of gas at a high pressure, upon which duty was assessed at the rate of 45 per cent. under the provisions of paragraph 193, and which are claimed to be dutiable properly at 35 per cent. under paragraph 152, as "steel tubes, finished, not specially provided for."

Steel Floor Plates.

The Treasury Department has announced its acquiescence in the decision of the United States Circuit Court of Appeals at Philadelphia in the case of R. D. Wood & Co., importers of steel floor plates. The plates had been assessed with duty under paragraph 126, but the claim of the importers that they were properly dutiable under paragraph 135 was sustained by the court.

The Cyclone Drill Company, Orrville, Ohio, has issued a pamphlet entitled "Your Plain Duty," which gives a number of articles on the subject of the necessity of obtaining a supply of pure water. These articles treat of drilled wells on farms, as well as the water supply for towns and small communities. In these days of contamination of rivers and ponds, attention is being turned quite generally to the necessity of obtaining a supply of water, which may be reasonably expected to be pure. The pamphlet is of an educational character, aiming to supply general information on this subject rather than specific details of the manner in which the company performs its functions in furnishing well drilling outfits.

Manganese Bronze.*

BY C. B. SPARE.

The best present day alloys of manganese bronze are the results of years of scientific research by several of the largest manufacturing concerns, which maintain chemical and physical testing laboratories in connection with their brass foundries. Of all the metal industries, brass founding is almost the last to pass from the empirical and rule-of-thumb to a scientific metallurgical basis. In fact, the majority of the brass and bronze manufacturers have never used chemical analysis or a testing machine and therefore have only a general idea of the composition and physical properties of their products. But conditions have changed, or are changing, and engineers have multiplied powers and manipulated pressures beyond all former figures. Machinery is more powerful, more complicated and more severely tested than ever before, and while the steel and other industries have made great advances and kept pace of requirements, the same rate of improvement has not been maintained in copper and brass, except in the case of the high tensile strength of manganese bronzes.

Manganese bronze first found its important practical application in the manufacture of propeller wheels for ships. Now cast iron and cast steel have been almost universally displaced by it, not only for all naval vessels, but the merchant ships of the world have adopted it as standard practice. Marine engines have been increased to such vast powers that 20,000, then 40,000 and now 70,000 i.h.p. are transmitted through manganese bronze propeller wheels. In some ships the speed runs upward of 300 rev. per min.

There is no metal of equal strength and toughness which will produce such sound, smooth and intricate castings, true to the form of the pattern. These qualities permit of the maximum fineness of section of the propeller blade, and at the surface speeds of thousands of feet per minute friction is reduced to a minimum. This bronze is practically incorrodible in sea and alkali waters. Likewise dilute acids and acid mine water are withstood successfully. Cast blocks of manganese bronze immersed for one year in the most acid mine water in Pennsylvania, containing about 300 grains of sulphuric acid per gallon, showed no material corrosion, and a test piece cut from this metal showed no diminution in tensile strength from that of a duplicate specimen previously tested.

Testing Methods and Results.

Test pieces cut from cast propellers should show an average ultimate tensile strength of 70,000 lb. per square inch, elastic limit of about 35,000 lb., or one-half the ultimate; a 25 per cent. elongation in 2 in. and 25 per cent. reduction of area. The reduction of area follows the elongation closely in cast manganese bronze. These figures can be varied to suit requirements. A soft manganese bronze having an ultimate strength of 60,000 lb. per square inch and 40 or 50 per cent. elongation in 2 in. is the lower limit, while an exceedingly hard manganese bronze can be made to test over 90,000 lb. per square inch., with even as much as 30 per cent. elongation.

The methods of testing manganese bronze physically do not differ materially from the standard methods for steel. Test pieces according to the standard United States Government sizes, 0.505 in., 0.798 in. or 1 in. in diameter, are machined 2 in. between punch marks and threaded. In the case of castings there is not a sharply defined elastic limit and the yield point cannot be determined by the drop of the beam. Multiplying dividers (such as devised by J. A. Capp) or a standard extensometer will establish quite closely the point at which an appreciable change in the rate of stretch takes place. In the case of rolled or forged manganese bronze the yield point is more closely defined, and the elastic curve is frequently sharp enough to detect the drop of the beam or a halt of the gauge wheel. In compression cast manganese bronze, if properly made, shows an average elastic limit of 35,000 to 40,000 lb. per square inch and a maximum crushing load of 90,000 to 100,000 lb. per square inch. Rolled or forged manganese bronze tests 50,000 to 60,000 lb. elastic limit, and as high as 130,000 to 150,000 lb. maximum crushing load.

Rolling and Forging.

Manganese bronze can be rolled or forged readily at a red heat with the production of an exceedingly tough, dense and close grained metal. Microscopic examination of cast manganese bronze, after polishing and etching, reveals a very homogeneous and uniformly grained metal, but after rolling or forging to a sufficient reduction the structure is reduced to from 1-30 to 1-50.

Rolling or forging raises the proportional elastic limit to from 45,000 to 75,000 lb. per square inch, depending upon the finishing temperature and the amount of work done on the metal. Likewise the ductility and toughness are increased, but without a corresponding increase in ultimate strength.

Forged and rolled rods find a wide application as piston rods, shafts, axles and for all purposes where a metal of equal strength and toughness to carbon steel is desired, and which will not rust or corrode in the atmosphere or in mine or sea water. An especially soft and tough metal is made to resist vibratory and sudden stresses and shocks. It is used under very severe conditions in modern naval ordnance. Another application is in staybolts for locomotives. This bronze tests 40 to 50 per cent. elongation, with about 60 per cent. reduction of area.

The Demands of Electrical and Automobile Service.

Thus only a few of the better known applications of manganese bronze have been pointed out. The electrical industry is calling for it for turbo-generator sets, which are run at speeds up to 4000 rev. per min., and the blades of the steam turbine are satisfactorily made of extruded manganese bronze shapes. In this case the erosive action of high pressure steam is severe and under it most metals fail.

The infant industry which has grown to such lusty proportions in this country, automobile manufacture, has set a very high standard for materials demanded by its peculiarly hard service conditions. Automobiles with gasoline motors of 60 hp., and even as high as 130 hp., at speeds of 1000 to 1500 rev. per min., and running over all kinds of roadbeds at 60 and 100 miles an hour, have stimulated the improvement of the materials entering into their construction more, perhaps, than any other modern machine. The nickel-chrome and other high grade steels in gears and drop forgings have produced results never heard of before, and cast iron has been wonderfully improved by the requirements of automobile cylinders. Likewise manganese bronze, formerly used almost exclusively in warships, has been adapted to produce forgings and castings which will not crystallize or fail under similarly severe conditions.

* From a paper read at the Atlantic City meeting of the American Society for Testing Materials, June 27, 1908.

The Cincinnati Metal Trades Outing.

Nothing occurred to mar the pleasure of some 30,000 people who are in some way identified with the manufacturing side of the Cincinnati Metal Trades Association on Saturday, July 25, at Chester Park, in that city. It was the annual outing provided by members of the organization for their employees and families, and these, whether on the present pay roll or not, participated in large numbers. There were many prize athletic games and contests of speed and skill under the direction of Secretary John M. Manley and a large committee. At 6 o'clock 70 officials and heads of departments with guests sat down to a banquet served on the broad piazzas of the club house, with President John M. Niel as master of ceremonies. A number of congratulatory messages were received from absent members and friends, among these being an especially interesting one from Sherman C. Schauer of the Cincinnati Machine Tool Company. Short talks were made by all the ex-presidents present and other influential members of the Cincinnati tool manufacturing fraternity. Among them were Walter Laidlaw, Laidlaw-Dunn-Gordon Company; S. P. Egan, J. A. Fay & Egan Company; E. H. Hargrave, Cincinnati Tool Company; J.

C. Hobart, Triumph Electric Mfg. Company; B. B. Quillen, Cincinnati Planer Company; Philip Geier, Cincinnati Milling Machine Company, and Secretary John M. Manley of the association.

PERSONAL.

E. F. Moody, manager of the branch house of the Crucible Steel Company of America at Springfield, Mass., will retire from that position August 1. He expects to continue in the same line of business. D. E. Seymour, formerly of Springfield, lately of New Haven, Conn., will take charge of the Springfield office.

E. L. Graydon, who has been manager of the Bessemer Soil Pipe Company, Bessemer, Ala., for the past two years, has severed his connection with that company, to take effect August 30.

Vice-President J. B. Doan of the American Tool Works Company has returned to Cincinnati from a four months' tour of business and pleasure in Europe. He and his party had some interesting social experiences as well as satisfactory business relations with and among people of prominence abroad.

Leonard Schreiber, the venerable president of the L. Schreiber & Sons Company, Cincinnati, celebrated his 80th birthday anniversary July 24. He is still vigorous and spends much of his time at the structural steel, ornamental iron and bronze manufacturing plant bearing his name. The directors of the German Mutual Insurance Company, of which he is president, gave him a loving cup, and his fellow officials and heads of departments at the plant presented him with another of unique design.

Frank J. Llewellyn, division contract manager of the American Bridge Company, Chicago, has just returned much benefited from a five months' trip to China, Japan and the Orient, where he has been seeking recreation and recovery from impaired health.

Lane Johnson, who has for some time been connected with the main office of the Mesta Machine Company, Pittsburgh, Pa., has been placed in charge of a branch office, opened by the company at 844 Commercial National Bank Building, Chicago. The opening of this office has been compelled by the increased demand for the company's products in the Central West. These products are rolling mill machinery, gas and steam engines, condensers, machine molded gears, steel castings, &c.

Charles W. Blackman has been appointed general sales manager of the Driggs-Seabury Ordnance Corporation, with headquarters at Sharon, Pa.

Horace V. Winchell of Minneapolis, Minn., announces that he has resigned his position as chief geologist of the Great Northern Railway Company and is now open to engagements in the general practice of his profession. Mr. Winchell has been for many years famous as a specialist in copper and iron ore mining.

The Hazard Mfg. Company, Wilkes-Barre, Pa., has about completed improvements to its plant, which will increase the capacity 50 per cent. They include a new wire rope mill and power plant, containing many important features in equipment and arrangement. The new wire rope building is on the opposite side of the street from the present plant, to which it is connected by both a bridge and a subway. It is 50 x 165 ft., four stories and basement, of brick and steel construction, and the two lower stories are equipped with two 5-ton traveling cranes, the upper floors containing the machinery for the manufacture of wire rope. The new power plant is equipped with 1200-hp. of Babcock & Wilcox water tube boilers, with the corresponding horsepower capacity of engines and generators. As soon as the new power plant is in operation the space occupied by the old building will be used by other departments. The machinery is to be motor driven, and shipping facilities are furnished by a switch from the Pennsylvania Railroad, which runs between the new rope mill and the power plant. It is expected that the new buildings will be ready for operation about August 1.

NEWS OF THE WORKS.

Iron and Steel.

The Mesta Machine Company, Pittsburgh, Pa., has shipped one of the long crosshead blowing engines, having two high and two low pressure cylinders, 44-in. steam and 84-in. air by 60-in. stroke, and 84 and 84 x 60 in. stroke, to the Cleveland Furnace Company, Cleveland, Ohio, and the other three on contract are nearing completion. Recent business taken by the company includes a simple Corliss engine of 500 kw. capacity for the Pittsburgh-Buffalo Company, Ellsworth, Pa.; two Helander barometric condensers, one of 3500 hp. capacity for the American Sheet & Tin Plate Company, the other of 3000 hp. capacity for the Struthers plant of the Youngstown Sheet & Tube Company, which is the third condenser that this latter company has ordered.

The Eastern Concrete Steel Company, George T. Roberts, manager, 401 D. L. Morgan Building, Buffalo, N. Y., which was awarded the contract last week for the Elk and Michigan streets grade crossing work, including 2200 cu. yds. of reinforced concrete retaining wall, is ready for bids on 131,000 lb. of steel rods for reinforcing concrete.

Niles Furnace of the Carnegie Steel Company, at Niles, Ohio, which has been idle for some months, is being repaired and will probably be put in blast in August.

General Machinery.

The Cedar Rapids Foundry & Machine Company, Cedar Rapids, Iowa, expects to enlarge its machine shop to provide room for the manufacture of universal stone crushers which it is now making.

The Atchison, Topeka & Santa Fe Railroad has awarded contracts for the construction of a 10-stall brick roundhouse and standard frame sand house to C. A. Fellows, Topeka, Kan., and for a mechanical coaling station to Fairbanks, Morse & Co., Chicago, Ill. These buildings are to be erected at Canadian, Texas.

The Walcott & Wood Machine Tool Company, Jackson, Mich., expects to increase its facilities by the erection of a new building and the installation of modern machinery, such as traveling cranes for handling the heavy machines. The company owns considerable land on the railroad and on this property it is planning to erect a building about 70 x 155 ft.

The Phillips Pressed Steel Pulley Works, Philadelphia, Pa., has taken out a permit for the construction of a building at Fourth street and Glenwood avenue 78 x 170 ft., to cost about $7000. The greater part of the machinery required will be of special design and will be built at the company's shops. The increasing demand for its pulleys, especially the larger sizes, has necessitated the enlargement of the paint.

The Wells Brothers Company, Greenfield, Mass., manufacturer of screw cutting tools and machinery, states that "there seems to be a better feeling as regards business than there was. For some time past our jobbing customers have had but a small stock, and while even now they are not increasing this stock to a great extent, we think that the stock orders are larger and more frequent than they have been in the past. As a proof of this, although the last month showed but a slight increase in the number of orders over those received in May, the amount of sales was considerably more. Some of our representatives are out on their trips and we are receiving favorable reports from them, both in shape of orders and in their criticism of the business conditions as they see them."

The Grant Iron Works, Houston, Texas, incorporated with a capital stock of $50,000, has just completed shop buildings, which include a machine shop 72 x 160 ft. and a blacksmith shop 32 x 46 ft. Machinery for equipment of the plant has been ordered and it is expected it will be ready for operation by September 15. The company will devote its attention principally to the rebuilding of locomotives, cars and heavy sawmill and irrigation machinery. The officers of the company are A. S. Grant, president and general manager; H. A. Paine, first vice-president; F. E. Pye, second vice-president, and William A. Grant, secretary and treasurer.

Operations have been resumed at the plant of the Kilby Machine & Locomotive Works, Anniston, Ala.

Sealed bids will be received by F. W. Ormsby, secretary, Water Works Department, Oswego, N. Y., for one 15-ton hand power traveling crane.

Power Plant Equipment.

Plans and specifications are being prepared by the State architect at Albany for an addition to the boiler house and installing a new 100-hp. horizontal tubular boiler at the Western New York House of Refuge for Women at Albion. The approximate cost is $11,000. Bids will soon be called for by the Board of Managers.

The Commissioners of the Nutwood Drainage and Levee District, Jerseyville, Ill., will receive bids until August 19 for a pumping plant and sluiceway, including one 300-hp. water tube boiler, one 500-hp. horizontal compound condensing engine, one 40-in. and one 36-in. centrifugal pump, together with foundations, appurtenances, piping, &c.

The Buffalo, Lockport & Rochester Railway Company, Lockport, N. Y., is preparing plans for five substations, to be located at Albion, Knowlesville, Holley, Medina and Spencerport, each

to be of sufficient size to accommodate three 400-kw. rotary transformers with necessary operating apparatus. The substations are to be located 9½ miles apart, built of concrete, with steel roof trusses. Work on buildings will be started in 30 to 60 days.

The Tower Engineering Company, Buffalo, N. Y., has been incorporated, with E. J. G. Tower as president, H. G. Tront and H. G. Walker, of the King Iron Works, as secretary and treasurer, respectively, to control sale and manufacturing rights of a special noiseless valve type of gas engine and gas producer plant, which will be manufactured under contract by the King Iron Works, which is now building a sample 150-hp. engine and producer outfit. Mr. Tront is building special furnaces to be installed in the new brass foundry and is ready for bids on two hand power jib cranes, structural steel runway to be installed in foundry building, and may later purchase electric traveling crane, 110-span, and a 150-ft. structural steel runway, to be installed in machine shop. The Tower Engineering Company will engage in general contracting for complete power plant installations.

The Water Works Department, Oswego, N. Y., has called for bids on the following equipment to be installed at pumping station: Three 150-hp. horizontal tubular boilers and one 50,000-gal. steel water tank. Bids on brick and steel boiler house building will soon be called for.

The Wallkill River Company, Walden, N. Y., will erect a $150,000 hydraulic electric generating plant on Wallkill River at Alden, the power to be utilized by the New York Knife Company, the Wallkill Valley Light & Power Company and the Orange County Traction Company. Construction work on the dam has been started. Work on power plant and equipment installation will be started this fall.

Foundries.

The Aluminum Foundry Company, Manitowoc, Wis., has increased its capital stock from $50,000 to $100,000 for the purpose of adding brass and bronze to its line of aluminum castings. Additions to the foundry buildings will be made which will increase the capacity of the plant about 50 per cent.

A. T. Zentmyer, Hagerstown, Md., will replace his present foundry with a building 40 x 150 ft., with a wing 35 x 50 ft. and pattern house 30 x 50 ft.

The Headford Brothers & Hitchins Foundry Company, Waterloo, Iowa, maker of architectural iron work and fine gray iron castings, has just completed an addition, 50 x 70 ft., to its foundry building, and has under construction an office building, 36 x 36 ft., which will be ready for occupancy within a short time. The company reports that these improvements were made necessary by a large increase in its business, which from present indications bids fair to exceed that of last year.

The American Brake Shoe & Foundry Company, New York, which has lately been using a portion of the plant of the Passaic Steel Company, Paterson, N. J., for tests for the manufacture of manganese rails, is considering the acquisition of a large rubber manufacturing plant.

The Buffalo, N. Y., branch of the American Malleable Company is to build an addition on each end of the plant, 100 x 200 ft., increasing the capacity of foundry and annealing rooms by one-third capacity.

The Will & Baumer Company, Syracuse, N. Y., has taken option on the old plant of the Susquehanna Hardware Mfg. Company at Susquehanna, Pa., and is considering converting the buildings into a brass foundry to be occupied by the Brass Specialty Company, New York, in which Mr. Baumer is largely interested.

The Board of Contract & Supply, Albany, N. Y., has awarded contract to the Camden Iron Works, Camden, N. J., to furnish the city of Albany with 2000 tons of iron pipe and special castings, at its bid of $21.80 a ton for pipe and $50 a ton for special castings. The contract amounts to about $50,000.

Bridges and Buildings.

The Upstate Public Service Commission, Albany, N. Y., has ordered that a structural steel viaduct and approaches be erected at Hamilton street, La Salle, Niagara County, for elimination of grade crossing over the lines of the New York Central and Erie railroads and right of way of the Buffalo, Thousand Islands & Portland Railroad. Plans will be prepared at once and bids on material and construction called for later.

Fires.

The large plant of the American District Steam Company, North Tonawanda, N. Y., was almost completely destroyed by fire July 24. The main building, containing about $40,000 worth of special machinery, the foundry, engine and boiler rooms, dry kiln and stock yard, with 1,000,000 ft. of lumber, were entirely consumed. The estimated loss is $115,000, which is covered by insurance. The buildings saved were the pattern house, flask house and two warehouses in which were stored $30,000 worth of finished product. It is expected the plant will be rebuilt at once.

The machine and blacksmith shops of the Fresno Agricultural Works, owned by James Porteous, at Fresno, Cal., were burned July 20, the loss being about $25,000.

The metal ferrule works of Charles E. Green, Newark, N. J., was damaged $20,000 by fire July 24.

Hardware.

A company with a capital stock of $15,000 is now being formed by Wesley Kouns, Salina, Kan., for the manufacture of a galvanized steel hay rake, loader and stacker combined, and galvanized steel push rakes.

Having enlarged its original line of fence posts to include clothes posts, hitching posts, flag poles, &c., the Milwaukee Steel Fence Post Company, Milwaukee, Wis., has filed an amendment to its charter changing the corporate name to the Milwaukee Steel Post Company.

A movement is on foot to organize a stock company at Charleston, Ill., for the establishment of a stove foundry at that place, with a capital of $40,000. A large part of the stock has been subscribed, but the success of the undertaking is not as yet assured. J. W. Ramsey, manager of the La Salle Securities Company, Chicago, is interested in the project.

The Pope Mfg. Company, Hartford, Conn., is to abandon its factory at Hagerstown, Md., and will concentrate its bicycle business at Westfield, Mass. This will add to the importance of the latter works, as all bicycles for juveniles will hereafter be manufactured there. The Pope Company thus reduces the number of its works to two, as the automobile business has been concentrated at Hartford.

Miscellaneous.

The West Allis Malleable Iron & Chain Belt Company, Milwaukee, Wis., has resumed operations after being closed down for several weeks, and 250 men are being given employment.

The Eriez Stove & Mfg. Company, Erie, Pa., will not require any additional equipment at the present time for the new additions to its plant, aside from line shafting, hangers, &c. The company is looking around for a low pressure steam heating plant, and contemplates putting in a sprinkler system for fire protection.

William Lewin, Kansas City, Mo., has withdrawn from the Lewin Scrap Iron Company and has opened an office at 1222 West Ninth street, where he carries on a general brokerage business in scrap iron, steel and metals, old railroad materials, &c.

Rand, McNally & Co., New York, have let contract for the erection of an electrotyping foundry and boiler house at Ossining, N. Y., for which a small stack, blower, heating and plumbing equipment will be required.

The recent fire at the plant of G. Wilson & Son, manufacturers of scales, Toronto, Ont., did but little damage.

The Hamburg Mfg. Company, Hamburg, Pa., which was organized last fall and which established a modern plant for the manufacture of the New Century chain hoists, under patents of Henry J. Schmick, is receiving a good demand for its products. Recent orders include 15 2-ton hoists from a large Ohio rubber company and 12 ½-ton, 25 1-ton, 10 1½-ton and 6 2-ton hoists for the Mare Island Navy Yard. The company has orders booked for about 30 hoists of the Eureka pattern, which is just being perfected.

The Compressed Flint Brick Company, Webb City, Mo., is preparing to erect and equip a new brick making plant at Kansas City, Mo., a site for which has been selected at Sixteenth street and Elmwood avenue. Ornamental pressed brick will constitute the product of the plant, which will be equipped with hydraulic presses. The company operates a similar plant at Webb City, Mo.

Plans have been completed by the Boone Engineering & Architectural Company, Boone, Iowa, for a three-story fireproof brick and concrete telephone building, 30 x 50 ft., the approximate cost of which is estimated at $10,000. It will be equipped with new automatic system of underground cables, converters, batteries, dynamo, switchboard and other modern accessories. A gas engine will be required for the generation of electric power service. About $100,000 will be expended in these improvements.

A franchise has been granted to a local company for the establishment of a gas plant in the city of Fairbury, Neb. The franchise requires completion of the organization and acceptance of its terms within 30 days. E. R. Bee is interested in the enterprise.

A company has been organized at Little Rock, Ark., by Fred Newton Gibb for the purpose of developing and promoting a spring wheel for automobiles. No definite arrangements have as yet been made for the manufacture of this appliance.

The announcement is made that the executive offices, including the purchasing department, of the New England Investment & Sureties Company, which controls the electric railway holdings of the New York, New Haven & Hartford Railroad in Massachusetts, will be removed from Boston to Springfield, Mass. The company controls 600 miles of railway, and the purchasing department is an important buyer in the market.

The Greenpoint Metallic Bed Company, Brooklyn, N. Y., will need very little new machinery, as the recent fire at its plant only damaged the iron stock and paint departments.

The Iron and Metal Trades

A more cheerful tone pervades the Iron markets, even Pittsburgh, for so long the bluest spot in the country, developing some optimism. The volume of business, taking it as a whole, is slightly better, but prices still display irregularity and in some branches are even a little lower. There has been some gain in the rate of operations since specifications are coming in more freely, but mills are often forced to lie idle for considerable periods, to wait for the accumulation of sufficient specifications to justify a brief period of running. So it happens that press reports again and again refer to the starting of the same plant, while the intermediate stoppages are passed over in silence.

In some quarters the idea seems to have arisen that there was some conflict in the statements recently made that the works of the Steel Corporation were running at about 56 per cent. of capacity, and the announcement just issued that the average daily bookings for the first 24 days of July are in excess of 26,000 tons, equivalent to 72 per cent. of full capacity. Since the first refers to actual manufacturing operations and the other to orders entered, there is no conflict. It may be well to explain, however, that included in the July bookings are considerable quantities of steel bars placed by agricultural implement makers for delivery during twelve months, and that therefore the increase in the tonnage in other lines is not significant.

In some sections the Pig Iron markets are easier, while in others they are steady. Pittsburgh reports sales of Bessemer at $15.65 Valley furnace, so that the market which was nominally at $16 for large quantities, and $15.75 for small lots for a considerable period, is now squarely lower. In the East, a Pennsylvania Structural mill and bridge shop bought 12,000 tons of Basic Pig at close to $15, for delivery over four months. In the Central West an Ohio car builder purchased about 5000 tons of different Irons, one-half thereof being Malleable Bessemer. A Pittsburgh producer of plumbing castings is in the market for about 8000 tons for different works, which will test the Foundry Iron markets.

The Steel Rail trade remains quiet. The Chesapeake & Ohio order has not yet been placed. Inquiries for Rails for export are coming in more freely. A Canadian line is in the market for 20,000 tons. The Grand Trunk business has not yet been placed. There are negotiations pending for Rails for South America, Australia and China.

The Steel work for the Oliver Building in Pittsburgh, involving 10,500 tons, has been placed. Orders have also been booked for 2,000 tons for approaches of a bridge in West Virginia, 2000 tons for the Toledo & Ohio, 1000 tons for the New Haven road and 1000 tons for Buffalo.

In the lighter lines Wire continues to make a good record, the business being better maintained in the summer than is usual. The Sheet mill capacity of the leading interest has gone up from 47 per cent. last week to 51 per cent. this week. The Merchant Pipe trade is developing steadily and some larger projects are under negotiation. The Tin Plate industry is showing signs of tapering off in activity. The canners are now supplied for the season.

The export trade is improving in volume. Among the recent transactions are 2500 tons of Cotton Ties for India, where the American product is given the preference over the English goods; 2000 tons of Bridge Material for Mexico and a cable order for 750 tons of Barb Wire for the Argentine.

Old Material is stronger and better prices are being realized in some of the principal primary markets.

The most important buying movement since the panic has occurred among domestic consumers of Copper. Still, it is only fair, and has been much exaggerated. Sales of Electrolytic Copper have been made at 13⅛c. and 13.07½c. and of Lake at 13¼c. Lead is slightly stronger, at 4.55c. and 4.60c., spot, New York.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	July29, 1908.	July22, 1908.	June24, 1908.	July31, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	$16.50	$16.50	$16.50	$22.00
Foundry No. 2, Southern, Cincinnati	*14.75*	14.75	15.25	23.75
Foundry No. 2, Local, Chicago	*17.00*	17.00	17.50	24.50
Bessemer, Pittsburgh	*16.55*	16.90	16.90	22.90
Gray Forge, Pittsburgh	14.90	14.90	14.90	22.40
Lake Superior Charcoal, Chicago	20.00	20.00	20.00	26.00
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	25.00	25.00	25.00	30.00
Forging Billets, Pittsburgh	27.00	27.00	27.00	34.00
Open Hearth Billets, Phila	26.20	26.20	26.20	31.75
Wire Rods, Pittsburgh	33.00	33.00	33.00	36.50
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	**13.50**	13.00	12.50	17.25
Steel Rails, Melting, Phila	13.50	13.50	13.50	17.50
Iron Rails, Chicago	**16.50**	16.00	15.50	20.75
Iron Rails, Philadelphia	18.00	18.00	18.00	22.50
Car Wheels, Chicago	**14.50**	13.00	13.00	24.50
Car Wheels, Philadelphia	13.50	13.50	13.50	25.00
Heavy Steel Scrap, Pittsburgh	**14.50**	14.75	13.25	17.75
Heavy Steel Scrap, Chicago	**12.50**	12.00	11.50	15.50
Heavy Steel Scrap, Philadelphia	**14.00**	14.00	13.50	17.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	*1.35*	1.35	1.40	1.85
Common Iron Bars, Chicago	1.50	1.50	1.50	1.78
Common Iron Bars, Pittsburgh	1.40	1.40	1.40	1.70
Steel Bars, Tidewater, New York	1.56	1.56	1.56	1.86
Steel Bars, Pittsburgh	1.40	1.40	1.40	1.60
Tank Plates, Tidewater, New York	1.76	1.76	1.76	1.86
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.70
Beams, Tidewater, New York	1.76	1.76	1.76	1.86
Beams, Pittsburgh	1.60	1.60	1.60	1.70
Angles, Tidewater, New York	1.76	1.76	1.76	1.86
Angles, Pittsburgh	1.60	1.60	1.60	1.70
Skelp, Grooved Steel, Pittsburgh	1.45	1.45	1.45	1.90
Skelp, Sheared Steel, Pittsburgh	1.50	1.50	1.50	1.90
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	1.95	1.95	1.95	2.00
Cut Nails, Pittsburgh	1.75	1.75	1.75	2.05
Barb Wire, Galv., Pittsburgh	2.40	2.40	2.40	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	**13.25**	13.00	13.00	21.00
Electrolytic Copper, New York	**13.07½**	12.75	12.87½	20.00
Spelter, New York	*4.45*	4.45	4.55	5.95
Spelter, St. Louis	*4.35*	4.35	4.40	5.80
Lead, New York	**4.55**	4.47½	4.50	5.15
Lead, St. Louis	4.40	4.32½	4.40	5.00
Tin, New York	**30.40**	29.75	27.60	40.25
Antimony, Hallett, New York	*8.00*	8.25	8.50	10.50
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, July 29, 1908.—(*By Telegraph.*)

Moderate improvement is generally reported, but nowhere is it pronounced enough to warrant the extravagant reports which are continually appearing in the daily press of extensive resumption of mill activities and the reemployment of large bodies of workmen. Through the present month there has been some increase in iron and steel consumption, as is evidenced by a moderate increase of active mill capacity. It is doubtful, however, if the gains made during the month are being fully maintained in all directions; in any event, it is certain that they do not, on the whole, show an increasing ratio. Plates and Sheets continue extremely quiet, and although practically all of the Bar mills in this district are either now in operation or about to resume, they have no large amount of specifications on hand, and for the present at least will continue to run short of capacity and intermittently, as heretofore. These condition will likely remain unchanged until specifications against the recent large contracts entered begin to come in. Merchant Pipe is one of the few mill products in which there is a steady improvement, but this is measured by very small degrees. While more specifications are coming to the Structural mills, fabricators have closed little new business. No deals of important tonnage were included in last week's transactions. Continued activity in Scrap Iron has resulted in still further price advances. This movement has been aided by a better demand from both mills and melters, though as a rule consumers are buying only moderate quantities. Rerolling Old Steel Rails, which in April were rather a

drug on the market at $12, are now fairly strong at $16. The advance in prices of this material has had a steadying effect on the price of high carbon Bars.

Pig Iron.—In the transfers of tonnage effected last week nothing of significance, either as to price or demand, was developed. Carload buying is still the rule, with here and there an order for 100 to 300 tons, but all for early delivery. There is nothing in the character of the demand indicative of special interest in any direction, since it is plain that orders are prompted in almost every case by present needs. The Southern situation is not materially changed, although it may be noted that the Republic Iron & Steel Company has advanced its price to $12.50, for last half; which rate is likewise being held by the Tennessee Coal, Iron & Railroad Company. Under present conditions, this, of course, means practical withdrawal from the market. There is no evidence that better than $12 on normal Phosphorus Iron is being done by the Birmingham furnaces, although $11.50 is now easily obtainable on the higher Phosphorus Irons of northern Alabama and Tennessee. We note one sale of 200 tons of No. 2 Foundry at $12, Birmingham, and another, which is perhaps the most important of the week, of 800 tons of Southern Gray Forge, at $10.75, which was taken by a local Pipe interest. Several fair-sized inquiries have appeared, which, since they concern deliveries confined principally to the third quarter, are regarded as representing actual requirements. These range in amounts from 500 to 1500 tons. There are also inquiries out from a prominent local interest for 1000 tons, equally distributed between Northern and Southern Irons. The future trend in this market will naturally be governed by the rate of foundry consumption, which at the present is increasing very slowly in some directions, and in others is apparently at a standstill. The following quotations are for July, August and September delivery, f.o.b. Chicago:

Lake Superior Charcoal	$20.00 to $20.50
Northern Coke Foundry, No. 1	17.50 to 18.00
Northern Coke Foundry, No. 2	17.00 to 17.50
Northern Coke Foundry, No. 3	16.50 to 17.00
Northern Scotch, No. 1	18.00 to 18.50
Southern Coke, No. 1	16.35 to 16.85
Southern Coke, No. 2	15.85 to 16.35
Southern Coke, No. 3	15.35 to 15.85
Southern Coke, No. 4	14.85 to 15.35
Southern Coke, No. 1 Soft	16.35 to 16.85
Southern Coke, No. 2 Soft	15.85 to 16.35
Southern Gray Forge	14.35 to 14.85
Southern Mottled	14.10 to 14.60
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	18.40 to 18.90
Jackson Co. and Kentucky Silvery, 6 %	19.90 to 20.40
Jackson Co. and Kentucky Silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky Silvery, 10 %	22.90 to 23.40

(*By Mail.*)

Billets and Rods.—No new demand has arisen and the market remains exceedingly quiet. A few small orders for Car Axles are heard of occasionally, but they are not significant of any special movement, being confined to incidental requirements that arise from time to time. Prices continue unchanged at $28.50, base, Chicago. On Wire Rods, for which there is a moderate demand, we quote: Bessemer, $33; Basic, $34; Chain, $33, all at Pittsburgh.

Rails and Track Supplies.—Except for a few small orders of inconsiderable size, no Rail orders are being entered nor are any inquiries reported that promise any improvement in this respect in the near future. The No. 1 Rail mill of the Illinois Steel Company rolling standard sections is still running at a moderate rate and will probably continue active throughout the month of August. Unless new additions of considerable size are added to specifications now in hand the mill will have them pretty well cleaned up before the end of August. A fair amount of business in Bolts, Spikes and Track Supplies is being entered, although the volume for the past week was hardly as great as in the two or three weeks preceding. Light Rails, on the other hand, have been coming out a little more freely of late, with the result that for the past 10 days the tonnage entered has been larger than for some time. Strong efforts are being made to steady Light Rail prices and these have been aided to some extent by the recent advances in Rerolling Steel Rails. Regular prices are still being cut, in competition with Rerolling mills, at least $3 or $4 a ton. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.50c.; car lots, 1.60c.; Spikes, 1.80c. to 1.90c., according to delivery; Track Bolts, 2.20c. to 2.25c., base, Square Nuts, and 2.35c. to 2.40c., base, Hexagonal Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—Last week's market presented nothing more than a miscellaneous lot of small contracts to engage the attention of fabricators. An aggregate of 1400 tons booked by the American Bridge Company was entirely made up of such business, which included 700 tons of railroad bridge material distributed among three or four leading Western roads. While the business coming through fabricators is lacking somewhat, mill specifications have within the past few days shown a moderate increase. This is ascribed, in part, to the fact that fabricators who have delayed furnishing specifications on contracts placed some time ago until the last minute are now compelled to ask for shipment. Prices from store are 1.95c. to 2c. Mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.78c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.78c.; larger than 6 in. on one or both legs, 1.88c.; Beams, larger than 6 in. on one or both legs, 1.88c.; Beams, larger than 15 in., 1.88c.; Zees, 3 in. and over, 1.78c.; Tees, 3 in. and over, 1.83c.

Plates.—Neither the Universal nor the Sheared Plate mill at the Illinois Steel Company's South Works is running, and therefore the accumulation of specifications is very slow, since most of the orders received are for immediate shipment and must be transferred to Pittsburgh mills. The amount of tonnage being entered in such orders is very light, and can hardly be said to be increasing. Store shipments, however, show a better average this month than last, indicating that stocks in Plate using shops are low, and warehouse stocks are being relied upon to supply the small lots required for immediate use. Prices are reported to be evenly maintained except by a few smaller mills rolling narrow widths, which are occasionally willing to shade the market from $1 to $1.50 a ton. We quote mill shipments as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.78c.; 3-16 in., 1.88c.; Nos. 7 and 8 gauge, 1.93c.; No. 9, 2.03c.; Flange quality, in widths up to 100 in., 1.88c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.88c.; Flange quality, 1.98c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier up to 72-in. wide, 2c. to 2.10c.; from 72 to 96 in. wide, 2.10c. to 2.20c.; 3-16 in. up to 60 in. wide, 2.10c. to 2.25c.; 72 in. wide, 2.30c. to 2.40c; No 8, up to 60 in wide, 2.10c. to 2.15c.; Flange and Head quality, 0.25c. extra.

Sheets.—About all that can be said of the mill demand for Sheets is that it holds fairly even, with but little fluctuation either way. Galvanized and Black Roofing Sheets are in better demand than the heavier gauges. Jobbers report that thus far July business has shown a slow but steady gain over June; at the same time orders from both mill and store continue to be restricted to actual present needs, there being as yet no disposition to buy ahead. We are advised that regular mill and store prices are being generally observed, the chief exceptions being cuts of $1 to $1.50 a ton made by few of the smaller independent mills. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 and 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.15c.; No. 12, 2.20c.; No. 14, 2.25c.; No. 16, 2.35c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—But little tonnage has been added to the contracts already taken for Steel Bars. Specifications against these contracts have not begun to come in in any quantity, and until they do intermittent operations of the mills will continue to be the rule. The Sylvan Works of the Republic Iron & Steel Company started up this week with one or two trains of rolls, and the East Chicago plant is also running, but the Tudor Works at East St. Louis is still idle. The Bay View Works of the Illinois Steel Company has six mills on this week, and the Interstate Iron & Steel Company's East Chicago plant is in operation. The Inland Steel Company expects to start up its new continuous Merchant Bar mill and Sheet Bar mill this week. None of the mills that have been idle during the past three weeks has accumulated enough specifications to keep it going for more than a week or so at the most, but all are anticipating greater activity when the implement makers begin to call for material, as they are expected to do in the next 30 days. Prices continue without change, and are reported to be regularly held. Quotations, Chicago, are as follows: Steel Bars, 1.58c., with half extras; Iron Bars, 1.50c.; Hoops, No. 13 and lighter, 1.98c., full extra Hoop card; Bands, No. 12 gauge and heavier, 1.58c., half extra Steel Bar card; Soft Steel Angles and Shapes, 1.68c., half extras. Store prices are as follows: Bar Iron, 2c. to 2.15c.; Steel Bars, 1.90c. to 2c.; Steel Bands, 1.90c., as per Bar card, half extras; Soft Steel Hoops, 2.25c. to 2.35c., full extras.

Merchant Pipe.—Comparison of the orders entered in July shows that each week's business was slightly in excess of the preceding one, and while the improvement thus indicated is slow, it is nevertheless steady and progressive. No large purchases representing unusual requirements are included in this business, which consists principally of buying by the jobbing trade. These orders are more liberal in size,

although in no case do they go far ahead of current needs. Former prices are here repeated. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 73.2; 7 to 12 in., 70.2; Galvanized, ¾ to 6 in., 63.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 73 per cent. on Black Steel Pipe, ¾ to 6 in. About three points above these prices is asked for Iron Pipe.

Boiler Tubes.—Work in boiler shops has not increased sufficiently to be reflected in an appreciably greater demand for Merchant Tubes. Only small lots are being asked for, and a considerable portion of this business is taken care of by jobbers. Inquiries for Locomotive Tubes are rather more plentiful, but no general buying movement, such as has been anticipated for some time, has developed. We are advised that regular prices are being maintained. Mill quotations for future delivery, on the base sizes, are as follows: 2¾ to 4½ in., inclusive, Steel Tubes, 63.2; Iron, 50.2; Seamless, 50.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	35	35	35
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2¾ to 3 in.	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—Some contracts for miscellaneous shapes included under this head are still being taken and it is stated that specifications have within the past few days begun to come in. Orders from the jobbing trade are perhaps not more frequent, but they aggregate a little larger tonnage than through the month of June. We quote as follows: Cold Rolled Shafting, on contracts for 100 tons and over, 57 per cent. off; carloads, 56 per cent. off, and less than carloads, 52 per cent. off, on which carolad freight is allowed within base territory. Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 1.90c. to 1.95c.; Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron finished, 1½ in. and wider, 1.40c.; under 1½ in., 1.55c. Planished Tire Steel is 1.60c., all f.o.b., at mill.

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Company was last week awarded 600 tons by Springfield, Ohio; 500 tons by West Branch, Mich., and about 300 tons by Burlington, Wis. The 1000 tons up for letting at Milwaukee has not yet been awarded. The only lots reported on which figures are now being asked are 300 tons for Portsmouth, Ohio, and a similar amount for a small town in Nebraska. Prices on small Pipe from 4 to 6 in. are said to be a little firmer, some of the principal makers being fairly well supplied with orders for these sizes. We quote nominally, per net ton, Chicago, as follows: Water Pipe, 4 in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for Gas Pipe.

Metals.—A stronger sentiment has developed in the Metal market and is finding support in more liberal orders from manufacturers. Where users have been buying 1000 lb. at a time, they are now taking 2 or 3 tons. Copper prices are considerably firmer, with a strong tendency toward fractional advances. Tin is up 2c., and Lead has moved up slightly. Spelter and Antimony continue quiet, being as yet uninfluenced by the improved tone of the market. We quote as follows: Casting Copper, 13¼c.; Lake, 13½c. to 13¾c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 30c.; small lots, 32c.; Lead, Desilverized, 4.45c. to 4.50c.. for 50-ton lots; Corroding, 4.85c. to 4.95c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 4.85c.; Cookson's Antimony, 10½c., and other grades, 9¾c. to 10¼c.; Sheet Zinc is $7, list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 10⅝c.; Copper Clips, 11c.; Red Brass, 11½c.; Yellow Brass, 9¾c.; Light Brass, 6½c.; Lead Pipe, 4c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 24c.; Block Tin Pipe, 27c.

Old Material.—Last week's offerings in the market developed material advances upon a number of important grades. There is a good demand for Rerolling Rails, which find a ready market at steadily advancing prices. A lot of 300 tons included in last week's railroad offerings brought $15.90, and a sale recently made topped $16. One of the local mills bought part of this tonnage, the remainder going to a dealer. There is more inquiry for Melting Steel and No. 1 Cast from consumers, on which some sales have been effected. A small lot of No. 1 Cast brought $13, and it is doubtful if any considerable quantity can be obtained below this price. Car Wheels, in which there has been nothing doing for some time, are beginning to show signs of activity. On a lot of fair tonnage recently offered by one of the railroads, around $14.25 was bid, which price it is understood was declined. Another lot of 300 tons is reported to have brought $14.60. Large quantities of Wheels, held speculatively by dealers and others, will not come on the market at anywhere near the present range of prices, being held for an advance that will yield a large profit. The appearance of more consumers in the market has, aside from the actual advance in prices, given it a decidedly firmer tone; but at the same time it is evident that the bulk of the trade is among the dealers themselves. We quote per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$16.50 to $17.00
Old Steel Rails, rerolling	15.50 to 16.00
Old Steel Rails, less than 3 ft.	13.50 to 14.00
Relaying Rails, standard sections, subject to inspection	19.00 to 20.00
Old Car Wheels	14.50 to 15.00
Heavy Melting Steel Scrap	12.50 to 13.00
Frogs, Switches and Guards, cut apart.	13.00 to 13.50
Mixed Steel	10.25 to 10.75

The following quotations are per net ton:

Iron Fish Plates	$15.50 to $16.00
Iron Car Axles	17.50 to 18.00
Steel Car Axles	16.00 to 16.50
No. 1 Railroad Wrought	12.25 to 12.75
No. 2 Railroad Wrought	11.25 to 11.75
Railway Springs	12.25 to 12.75
Locomotive Tires, smooth	13.00 to 13.50
No. 1 Dealers' Forge	10.00 to 10.50
Mixed Busheling	7.50 to 8.00
Iron Axle Turnings	6.00 to 6.50
Soft Steel Axle Turnings	6.00 to 6.50
Machine Shop Turnings	6.00 to 6.50
Cast Borings	5.00 to 5.50
Mixed Borings, &c.	5.00 to 5.50
No. 1 Mill	7.00 to 7.50
No. 2 Mill	6.00 to 6.50
No. 1 Boilers, cut to Sheets and Rings.	9.50 to 10.00
No. 1 Cast Scrap	12.50 to 13.00
Stove Plate and Light Cast Scrap	10.75 to 11.25
Railroad Malleable	11.75 to 12.25
Agricultural Malleable	10.75 to 11.25
Pipes and Flues	9.50 to 10.00

Rogers, Brown & Co., 1515-1535 Corn Exchange Bank Building, Chicago, are now prepared to furnish high grade smithing and forging Coals, the sale of which is under the management of the Coke department.

Philadelphia.

PHILADELPHIA, PA., July 28, 1908.

Buying, with a few exceptions, has been light in all departments, although the trade continues to express optimistic opinions regarding the future. Not a great deal of business is expected to come out the coming month, but it is believed that by September more activity will develop in nearly every branch of the trade. Buyers in many cases are withholding business, pending some movement on the part of the railroads, and it is the general opinion that as soon as those interests begin to come into the market a pretty general resumption in the Iron and Steel trades can be expected.

Pig Iron.—The market has been rather inactive, although inquiries, particularly for Foundry Iron in small lots and for early shipment, have been somewhat more numerous. The larger consumers have covered their requirements pretty fully, as far as the third quarter is concerned, and are now in the market for Iron for the fourth quarter, and even more extended delivery. Sellers in most cases, however, are not disposed to take on orders for extended forward shipment at to-day's prices. The market, notwithstanding the immediate absence of any large volume of business, continues strong, and price concessions for good tonnages for either prompt or last half deliveries are becoming scarce. In a number of instances furnaces are pretty well booked up for the next 60 days, and unless they can take business at an advance over to-day's prices for delivery beyond that period, prefer to take their chances on a higher price, due to an expected better demand later in the year. Sales of Foundry Iron during the week do not aggregate a large tonnage. The bulk of the business has been in small lots for fairly prompt shipment, running from carloads up to a few hundred tons, at prices ranging from $16.50 to $17, delivered, for No. 2X Foundry. There are a number of inquiries out for larger tonnages for fourth quarter shipment, but these do not close promptly, sellers usually asking $16.75 to $17.25, delivered, for standard No. 2X Iron for such delivery, but they are not forcing business. The Pipe makers are in the market for some low grade Iron, but sellers have not yet met their ideas regarding price. Southern Foundry Iron has been dull. The majority of sellers hold No. 2 Foundry at $12, Birmingham, and although $11.50 could be done in some instances, the business transacted has been light. Virginia Irons have not been active. Sales of No. 2X Foundry Iron have been reported in lots up to 100 tons at $17, delivered, for prompt shipment, while small lots of the same grade for September and October delivery have sold at prices equal to $17.25, delivered here. For fourth quarter, sellers hold Virginia No. 2X at $17.25 to $17.75, delivered. Some little tonnage of both No. 2X and No. 2 Plain Virginia Irons is reported as having been sold recently, for New England delivery, at full prices. There has been a little more inquiry for Forge Iron, but this grade is somewhat scarce, as furnaces are not disposed to make it at the prevailing price. Practically all of the Steel mills have now covered for their Basic Iron requirements for the third quarter, but several are in the market for fourth quarter Iron. But one sale of any consequence

was made the past week, that being a lot of 12,000 tons of Basic for delivery in the last four months of the year, at terms of a somewhat private nature, although the price is believed to have been pretty close to $15, delivered. Several inquiries which aggregate a pretty fair tonnage of Low Phosphorus Iron are before the trade, but sellers are firm on prices, and buyers do not seem inclined to place the business at the ruling quotations. Prices are being pretty firmly maintained, notwithstanding the quiet demand which is largely attributed to the usual summer inactivity of the trade. Quotations for deliveries during the third quarter are unchanged, and range as follows for standard grades, delivered in buyers' yards, eastern Pennsylvania and nearby territory, while for strictly fourth quarter delivery an advance of about 50c. a ton rules, dependent on grade and tonnage:

Eastern Pennsylvania, No. 2 X Foundry	$16.50 to $17.00
Eastern Pennsylvania, No. 2 Plain	16.00 to 16.50
Virginia, No. 2 X Foundry	17.00
Virginia, No. 2 Plain	16.50 to 16.75
Gray Forge	15.00 to 15.50
Basic	15.00 to 15.25
Low Phosphorus	21.00 to 21.25

Ferromanganese.—There has been practically no demand. Some sellers still quote $46, seaboard, for deliveries over the last half of the year. Others have made offerings as low as $43, Baltimore, for prompt business, but no orders have come out.

Steel.—A little better inquiry is to be noted. The Alan Wood Iron & Steel Company has enough business in hand to warrant the starting of three open hearth furnaces at its Ivy Rock plant this week, which has been idle for the past six weeks. The demand continues irregular, and orders received are almost entirely for prompt shipment. Prices are firm and unchanged, ordinary Rolling Steel being quoted for delivery in this territory at $26.20, with Forging Steel at $28.20, subject to the usual extras for high carbons and special sizes.

Plates.—Orders have been somewhat irregular, and with some mills do not aggregate as large a tonnage as was taken the previous week. Mills maintain a fairly even rate of production and have in some cases added to their melting capacity. No heavy inquiries have come out recently, although several fair propositions are being figured on. Some railroad and locomotive orders have been placed during the week, and one mill booked an order for 600 tons of Tank Steel. Practically all the orders placed have been for prompt shipment. Prices are being well maintained and range as follows for delivery in this territory:

	Carloads. Cents.	Parts carload. Cents.
Tank, Bridge and Boat Steel	1.75	1.80
Flange or Boiler Steel	1.85	1.95
Commercial Firebox	1.95	2.00
Marine	2.15	2.20
Locomotive Firebox Steel	2.25	2.30

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G	.15
No. 9, B. W. G	.25
Plates over 100 to 110 in	.05
Plates over 110 to 115 in	.10
Plates over 115 to 120 in	.15
Plates over 120 to 125 in	.25
Plates over 125 to 130 in	.50
Plates over 130 in	1.00

Structural Material.—A slight improvement is to be noted in the demand. The majority of the recent orders have been small, although there was one placed for a Southern railroad bridge which will take about 700 tons. Some larger building and bridge work is in sight, but these are not expected to develop rapidly. Current business is largely of a miscellaneous character, and while gains in production have been made by some mills, the amount is small. Prices are unchanged, 1.75c. to 1.90c. being quoted, according to specification for delivery in this territory.

Sheets.—A fair volume of business continues to come out and mills have been able to continue in operation at full time. Orders, however, are practically all for prompt shipment, so that mills have but little business ahead and are dependent on current orders to maintain their present output. Quotations are named as follows for mill shipments, a tenth extra being added for small lots: Nos. 18 to 20, 2:50c.; Nos. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—Some little improvement has occurred in the demand for Refined Iron Bars. Consumers show more tendency to take larger tonnages, and some mills have booked fair sized orders for early shipment. Prices are stronger and mills which have heretofore been willing to accept desirable business at low figures have advanced their prices so that quotations for delivery in this territory range from 1.35c. to 1.45c. Steel Bars are dull and quoted at 1.55c., delivered in this vicinity, with Re-rolled Bars at 1.50c.

Coke.—Sales of Coke have been light. Such business as has been placed has been for small tonnages for early delivery, with a few small contracts for delivery the last half of the year. Quotations at oven for Foundry Coke range from $2.15 to $2.35, with Furnace Coke at $1.50 to $1.75. For delivery in this territory the following range of prices is quoted:

Connellsville Furnace Coke	$3.65 to $3.90
Foundry Coke	4.30 to 4.50
Mountain Furnace Coke	3.25 to 3.50
Foundry Coke	3.90 to 4.10

Old Material.—The market continues strong, but inactive. Actual business transacted has been small, but the market continues to gain sentimental strength. Steel melters are not inclined to come into the market at present prices, while sellers would not dispose of any heavy tonnages at today's quotations. While some mills will pay $14, delivered, for Heavy Melting Steel Scrap, dealers in some cases are reported to have paid as high as $14.50, and a number of sellers report that they would not dispose of their Heavy Steel at $15, delivered. The rolling mills are buying Scrap suitable for their use somewhat more freely, but in small lots, as any heavy demand would no doubt result in a sharp advance in the price. Quotations on some grades have advanced on moderate sized sales; others are unchanged, and we quote nominally as follows for deliveries in buyers' yards, eastern Pennsylvania and adjoining territory:

No. 1 Steel Scrap and Crops	$14.00 to $14.50
Low Phosphorus	18.00 to 18.50
Old Steel Axles	18.50 to 19.00
Old Iron Axles	22.00 to 22.50
Old Iron Rails	18.00 to 18.50
Old Car Wheels	13.50 to 14.00
Choice No. 1 R. R. Wrought	16.50 to 17.00
Machinery Cast	14.00 to 14.50
Railroad Malleable	12.00 to 12.50
Wrought Iron Pipe	13.00 to 13.50
New Bundled Sheets	12.00 to 12.50
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	7.50 to 8.00
Wrought Turnings	10.00 to 10.50
Stove Plate	11.50 to 12.00
Cast Borings	9.00 to 9.50
Grate Bars	12.00 to 12.50

Cincinnati.

CINCINNATI, OHIO, July 29, 1908.—(*By Telegraph.*)

Taking into consideration the entire range of Iron and Steel products, the local situation presents an improvement over last week. There has been an improvement in both buying and in inquiries among the machinery men, and sales of Iron during the week have been quite satisfactory, particularly of Foundry Irons. A number of idle plants in the vicinity have started up, although on short time and with limited forces, and others which were kept going more to retain the shop organization than anything else have added some men and are working on orders. The resumption of operations at several Steel mills has stimulated the Scrap markets to a show of activity, and prices as a rule on Melting Scrap have been advanced from 50c. to $1 a ton, with consumers usually holding off for the minimum quotations earlier in the year.

Pig Iron.—Many melters of Iron are feeling the market for next year's prices, but the furnace people generally are loath to talk 1909 business on Pig Iron. Foundry Irons have led in importance the past week, and some good sized sales have been negotiated, but for the most part quietly and directly with the furnaces. Contracts read "for the balance of the year," and in some cases, where a special price was made, conditionally extend to next year. Ideas of all sellers are for considerably higher Iron on next year's deliveries than are quotable for any period this year. Charcoal Irons are getting some attention, and illustrating the ideas of furnaces making this grade a quotation of $30, at furnace, for next year's delivery is significant. The stove makers have bought some Iron during the week, Michigan concerns usually taking the product of local furnaces. An Ohio melter bought 200 tons of High Silicon off Iron, running 4 to 5 per cent. and over 0.05 in sulphur, and some Southern Foundry Iron at a price understood to be slightly under market quotations. A closely contested sale to an Ohio car manufacturer was of 2500 tons of Malleable, 1200 tons of Lake Superior Charcoal and 1000 tons of low grade Northern Foundry. The greater part of this is accredited to a Central Ohio furnace interest, the Malleable at about $14.75, Ironton, with a differential of about $1 on the Forge, which was on an analysis basis. Another car manufacturing company, which was in the market for 1000 tons of Foundry Iron and 500 tons of Forge for delivery at its Detroit shops, is said to have taken the tonnage desired from nearby furnace interests. The inquiry for Steel making Irons from an Ohio melter is said to have resulted in the purchase of between 2000 and 3000 tons from a nearby furnace, which has an advantage of 40c. in freight rate. Ohio Silveries are still quotable on a basis of $18.50 for 8 per cent. Malleable is nominally $15, Northern furnace, while Southern Foundry Iron is still quoted at $11.50, Birmingham, for No. 2. A number of large interests are holding for $12, and such sales as are negotiated at the lower price are carefully guarded. Differentiating between the two in this market, Northern Iron is weaker at the $15 price, and Southern stronger at the $11.50 quotation. Selling agencies are in receipt of a number of orders calling for tonnages in the

two to four and five carload class. Among these for larger shipments is an inquiry from the South for 2500 tons of Southern Foundry grades for the fourth quarter, and another from a Chicago concern for 250 tons of No. 2 Foundry for the third quarter. The local inquiry from one of the new foundries which was originally for 800 tons, and has in the meantime increased to something like 2000 tons, is still open, but is likely to be closed this month. For immediate delivery and to the close of the third quarter we quote f.o.b. Cincinnati, as follows, freight rates being $3.25 from Birmingham and $1.20 from the Hanging Rock District:

Southern Coke, No. 1	$15.25 to $15.75
Southern Coke, No. 2	14.75 to 15.25
Southern Coke, No. 3	14.25 to 14.75
Southern Coke, No. 4	14.00 to 14.50
Southern Coke, No. 1 Soft	15.25 to 15.75
Southern Coke, No. 2 Soft	14.75 to 15.25
Southern Coke, Gray Forge	13.75 to 14.25
Ohio Silvery, 8 per cent. Silicon	19.70
Lake Superior Coke, No. 1	16.70 to 17.20
Lake Superior Coke, No. 2	16.20 to 16.70
Lake Superior Coke, No. 3	15.70 to 16.20
Standard Southern Car Wheel	22.25 to 22.75
Lake Superior Car Wheel	21.75 to 22.25

(*By Mail.*)

Coke.—There is little change in the Coke market save some stiffening in price of the Virginia Furnace product, because of the labor difficulties in Alabama. While it was possible a week ago to buy the best grades at around $1.65, at oven, it is difficult to get a better price than $1.75 today. Virginia Foundry grades on contract bring about $2.25. Connellsville spot Foundry is obtainable on occasions at about $2, but for forward deliveries nothing better than $2.25 is heard. The Pocahontas spot market shows the greatest weakness, and some exceedingly low prices are named to move the product. On contract the price is $1.75 to $1.85, at oven.

Finished Iron and Steel.—Consumers who are wont to patronize the retail stores are still buying from hand to mouth, about the only difference being that these little orders are more frequent and specifications for forwarding more urgent. Orders for shipment of small lots by express are not infrequent here. Structural Iron and Steel are forging a little ahead, there being some very good specifications received, mainly from the South. Iron Bars are dull here, and nothing much in the way of improvement is expected before September. No change is to be noted in prices, dealers quoting as follows, f.o.b., Cincinnati: Iron Bars, carload lots, 1.65c., base, with half extras; small lots from store, 1.85c., base, half extras; Steel Plates, carload lots, 1.75c., base, with half extras; small lots from store, 1.85c., base, half extras; Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c.; Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c.; Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2c.; Blue Annealed Sheets, heavy, No. 16, carload lots, 2.15c.; small lots from store, 2.50c.; No. 14, carload lots, 2.05c.; small lots from store, 2.40c.; No. 10, and heavier, carload lots, 1.95c.; small lots from store, 2.20c.; No. 12, carload lots, 2c.; small lots from store, 2.30c.; Sheets (Light), Black, No. 28, carload lots, 2.65c.; Galvanized Sheets, No. 28, carload lots, 3.70c.; Steel Tire, 4-in. and heavier, carload lots, 1.95c.; Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.20c.

Old Material.—It is quite apparent that the market on Scrap used by the mills is in control of the large dealers here. Some good prices are heard of in connection with peremptory orders from the mills, and from 25c. to 50c. increase is asked over a week ago, all along the line. The feature of this market seems to be the frequent demand for deliveries on short sales. One local interest which is now on triple turn, and running all 10 Sheet mills, has purchased in this market 10,000 tons of Heavy Melting Steel Scrap since January 1. There has been some interest shown during the week in Relayers, a lot sold by railroads in Indiana bringing $17.75, gross ton, f.o.b. cars at loading point. It is reported here that some of the larger roads in this section have rejected all bids on Scrap, not being willing to move it under $15 in their own yards. Dealers' prices, f.o.b. cars Cincinnati, are about as follows:

No. 1 R. R. Wrought, net ton	$10.50 to $11.50
Cast Borings, net ton	4.50 to 5.50
Heavy Melting Steel Scrap, gross ton	11.00 to 12.00
Steel Turnings, net ton	5.50 to 6.50
No. 1 Cast Scrap, net ton	10.50 to 11.50
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	14.50 to 15.50
Old Iron Rails, gross ton	13.00 to 14.00
Old Steel Rails, long, gross ton	11.00 to 12.00
Old Steel Rails, short, gross ton	11.00 to 12.00
Relaying Rails, 56 lb. and up, gross ton	19.00 to 20.00
Old Car Wheels, gross ton	12.50 to 13.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00
Stove Plate, net ton	9.25 to 10.25

The National Tube Company is erecting a two-story hospital at its National Works at McKeesport, Pa. An electric ambulance will be used to convey injured employees to the new hospital.

Birmingham.

BIRMINGHAM, ALA., July 27, 1908.

Pig Iron.—A comparison of statistics relative to the rate of production, stock on furnace yards and the output shows the market to be on a firmer basis, but the volume of business to develop, according to present indications, does not afford foundation upon which the continuation of such conditions can be anticipated. The threatened shortage of fuel for furnace operation, however, is a feature not to be overlooked, which is evinced by the conservative course pursued by producers generally as to commitments. Within the past week some quotations have been lowered, but prices have not suffered a further decline. The revision in quotations is not general, and the basis of $11.50 to $12, which is considered the market price for prompt deliveries and the remainder of the third quarter, could be had probably of only one concern. Of the business offered lots of 100 to 200 tons each were the largest considerations. The sale of 100 tons of No. 3 Foundry for immediate shipment is reported at $11.50 per ton, Birmingham. An inquiry for quotations on 2500 tons each of Nos. 2 and 3 Foundry for delivery covering the remainder of the year is pending. No quotations on last quarter deliveries are reported at lower figures than $12 for No. 2, although a departure from this basis could no doubt be effected for the last half. An inquiry for 1000 tons to be delivered during the first quarter of 1909 did not elicit a quotation from one concern, and it is believed that other interests would make nominal quotation on such business. There has been no perceptible check in the movement from furnace yards. The melt is temporarily diminished by the suspension of operations at some foundries, but in most cases shipment as specified is being urged, with an occasional request that tonnage for delivery further advanced be included.

Cast Iron Pipe.—The market has been very quiet. Some orders of significance have been placed with Eastern concerns, but transactions reported by Southern interests are without an index to the status of prices. On small orders recently placed, which are attractive in the aggregate, quotations have been maintained. To the list of lettings for the near future a contract for the city of Wahoo, Neb., which is to be placed August 3, is added. It is learned that all former bids were rejected. The United States Cast Iron Pipe & Foundry Company was recently awarded contract for Gas Pipe to be furnished the city of Los Angeles, Cal. A contract covering Gas Pipe for New Orleans, La., was to have been placed July 25. The American Car & Foundry Company was the lowest bidder on Water Pipe for the city of Milwaukee, Wis. We quote Water Pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., $23; 8 to 12 in., $22; over 12-in., average $21, with $1 per ton extra for Gas Pipe.

Old Material.—The improvement in sentiment recently noted in this market has been maintained. A demand has developed for Cast Scrap and sales have been effected at an advance of 50c. per ton. The aggregate of other grades being moved is in excess of previous reports, without revision of prices. We quote as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$14.50 to $15.00
Old Iron Axles	14.00 to 14.50
Old Steel Axles	12.50 to 13.00
No. 1 Railroad Wrought	13.00 to 13.50
No. 2 Railroad Wrought	9.00 to 10.00
No. 1 Country Wrought	10.50 to 11.00
No. 2 Country Wrought	9.00 to 9.50
No. 1 Machinery	10.00 to 10.50
No. 1 Steel	9.50 to 10.50
Wrought Pipe and Flues	8.50 to 9.00
Light Cast and Stove Plate	8.50 to 9.00
Cast Borings	5.00 to 5.50

St. Louis.

ST. LOUIS, July 27, 1908.

The situation in general business shows a steady though moderate improvement, with a confident feeling that as fall approaches the volume of trade will increase more rapidly. The banks have regained the cash which had been withdrawn, and now have within 4 to 5 per cent. of the total of the corresponding time last year. The feature in Pig Iron is liberal specifications on contracts, together with requests for tracing shipments. Orders for Finished Iron also are coupled with urgent requests for immediate shipment. While there are no large orders, the fact that quick delivery is wanted shows a lack of stock on hand. Relaying Rails are in good demand, with small stocks in dealers' hands. Some new industrial plants are being built within the city limits, the larger being a wagon factory.

Coke.—A fair inquiry is noted for Coke. Absence from town on vacations is the occasion of some large buyers being temporarily out of the market. Prices remain unchanged, and range from $2.15 to $2.50, f.o.b. ovens, Connellsville, for 72-hr., according to quality and time of shipment. For deferred shipment, $2.25 is quoted as bottom. In general, the situation is regarded as quite satisfactory, and the outlook for an increased demand from foundrymen is good.

Pig Iron.—The market is not active for new business, though continued interest is indicated by consumers, since numerous inquiries are out for moderate quantities. One house reports an inquiry for 500 tons No. 4 Foundry August-December shipment. A marked feature is the fact that inquiries cover all kinds of Iron, showing a broadening of the market. A leading house states, in the aggregate it has received inquiries for the week for 1200 tons. No. 1 Southern Soft is so scarce that it likely might command more than the usual difference where a furnace could furnish it for early delivery. While we hear of some sales below the prevailing price of $12, Birmingham, the large companies are understood to refuse to sell at less, with some asking a higher figure, and a very confident feeling seems to prevail among buyers regarding the outlook. Specifications for shipments on contracts are fairly liberal.

Finished Iron and Steel.—In Structural Steel sales are at present confined to numerous small lots, for city and outside territory. A quite active demand for Steel for large contracts is assured for the coming month. Orders for special lots of Bars, Plates, Light Angles and Tees are being received from several railroads for quick shipment, and the present month has shown quite an increase in inquiry over any month of the current year.

Lead and Spelter.—Some improvement is seen in Spelter, which has advanced to 4.50c. For Lead, 4.40c. is asked. Zinc Ore is strong, at $33.50 to $34 per ton. Lead Ore is firm, at $59 to $60 per ton. It is reported that production at Joplin may be further curtailed, with the effect of stiffening the market. Some disposition is noted toward speculative buying of Lead and Spelter. Stocks of Spelter are not heavy. Business in the metals market has been more active than last month.

Old Material.—While considerable activity continues, it is mainly speculative, with transactions principally confined to dealers. Prices, however, are ruling firm, and dealers seem to find confidence gaining ground for a somewhat better demand from the mills in the near future. No important offerings are being made this week by the railroads. The stock of Relaying Rails is pretty well cleaned up, with further inquiry for supplies. We quote dealers' prices, per gross ton, f.o.b. cars, St. Louis, as follows:

Old Iron Rails	$14.50 to $15.00
Old Steel Rails, rerolling	13.50 to 13.75
Old Steel Rails, less than 3 ft	13.00 to 13.50
Relaying Rails, standard sections, subject to inspection	22.50 to 23.50
Old Car Wheels	12.50 to 13.50
Heavy Melting Steel Scrap	12.50 to 13.00
Frogs, Switches and Guards, cut apart	13.00 to 13.50
Mixed Steel	9.00 to 9.50

The following quotations are per net ton:

Iron Fish Plates	$12.50 to $13.00
Iron Car Axles	16.00 to 16.50
No. 1 Railroad Wrought	12.25 to 12.50
No. 2 Railroad Wrought	11.25 to 11.50
Railway Springs	10.50 to 11.50
Locomotive Tires, smooth	12.00 to 12.50
No. 1 Dealers' Forge	9.50 to 10.00
Mixed Borings	4.00 to 4.50
Machine Shop Turnings	7.00 to 7.50
No. 1 Boilers, cut to Sheets and Rings	7.00 to 8.00
No. 1 Cast Scrap	11.00 to 11.50
Stove Plate and Light Cast Scrap	9.00 to 9.50
Railroad Malleable	9.50 to 10.00
Agricultural Malleable	9.00 to 9.50
Pipes and Flues	8.00 to 8.50

The St. Louis Car Wheel Company reports a somewhat better demand since the first of the present month.

Cleveland.

CLEVELAND, OHIO, July 28, 1908.

Iron Ore.—The market is lifeless, with no indications of an improvement in the next few weeks. An occasional sale of a small lot is being made, but the majority of consumers are not ready to buy, and the Merchant Ore firms are not doing much in trying to close contracts. The movement of Ore down the lakes is not increasing to any extent, and it is estimated that the July shipments will not be much over 3,000,000 tons, or only about 500,000 tons larger than in June. The total shipments until August 1 will be only about 6,000,000 tons, or between 11,000,000 and 12,000,000 tons less than last year. The vessel situation shows no improvement. In fact, some of the vesselmen declare that it is as bad as it has been at any time during the season. More than one-half of the wild vessel tonnage is idle, and there are no cargoes, for many of the boats operated by shippers. Some of the boats that are now being operated will be laid up as soon as they reach their docks. The first Ore cargo shipped to the Steel Corporation's plant at Gary, Ind., reached that harbor July 23. The operation of that plant, together with an increase in the Ore shipments to Indiana Harbor, is expected to result in considerable change in the lake Ore traffic the next year or two, a large volume of the tonnage that is now coming to Lake Erie ports being then diverted to the new ports on Lake Michigan. The stockpiles of Ore on Lake Erie docks are not being reduced rapidly, shipments to the furnaces still being light. Ore prices at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, $4.50; Mesaba Bessemer, $4.25; Old Range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The market continues quiet. The sales during the week were limited to a 1000-ton lot of No. 2 Northern to a foundry interest, and a few other lots ranging from 100 to 400 tons. Inquiries from the East show considerable improvement. In the past few days a local interest has received a number of such inquiries, ranging from car lots to 4000 and 6000 tons. Some of the larger inquiries were both for the last half of this and the first half of next year. It is the belief that they were not for the purpose of merely testing the market, but that contracts will be placed. The market is not particularly firm, but prices are about stationary. We quote No. 2 Northern Foundry at $14.75 to $15, Valley furnace, for spot and last half delivery. The market is not as firm for spot Iron as for contracts for the balance of the year. Local furnaces quote No. 2 Foundry at $15, for outside shipment, and about $15.50, delivered, Cleveland. A slight improvement is seen in the demand for car lots in this territory. Shipping orders on Foundry Iron are somewhat better, and the tonnage taken in July will be considerably larger than in June. Outside of Foundry Iron the market is lifeless, there being no inquiries for Bessemer, and few for Basic, Malleable, or Southern Iron. For prompt shipment and for the balance of the year we quote, delivered, Cleveland, as follows:

Bessemer	$16.90
Northern Foundry, No. 1	$15.75 to 16.25
Northern Foundry, No. 2	15.40 to 15.75
Northern Foundry, No. 3	15.00 to 15.40
Southern Foundry, No. 2	15.85 to 16.35
Gray Forge	14.90

Coke.—The market is quiet, with scarcely any inquiry for either Furnace or Foundry grades. Prices remain about stationary. We quote Connellsville Furnace Coke for the last half delivery at $1.75 to $1.90, at oven. Foundry Coke is $2.25, at oven, for the last half, and $2.15 for spot shipment.

Finished Iron and Steel.—All mills report a decided improvement in orders. The actual tonnage in specifications placed on the books by the local representative of a leading interest during the week was nearly double that of any previous week this year. The orders include about everything in the line of Finished Material, but the bulk is for Steel Bars, Plates and Structural Shapes. The majority of the orders are for quick shipment. The increase in the demand is attributed partly to the fact that consumers have been holding off in placing orders until after their July inventories were completed, and it is not expected that the pace that was thus set will be kept up, but there are, nevertheless, a number of encouraging features about the market. Good sized specifications for Bars have been received from the implement makers. The good crop prospects make the business outlook very satisfactory for the implement manufacturers. The demand for Plates shows a steady improvement, and some of the week's orders have come from boiler makers, who had been out of the market for some time. Good Plate orders have also come from bridge builders and Structural shops. Bar Iron is about the only material in which there is no improvement in the volume of orders, the demand for Iron Bars still being light. It is expected that the Union and Empire rolling mills of this city, which have been shut down for about a month, will start up August 3, although with a limited tonnage on their order books. No new Structural work requiring a large tonnage is in sight, but some good specifications were received from local shops that have a fair amount of small work on hand. There is an improvement in inquiries for car lots of Light Rails from Coal mining companies. Some improvement is noted in railroad orders for Track Supplies. A local forge company is figuring on a contract for 1200 Car Axles and has an inquiry out for Billets. Some new contracts for Steel Bars, Shafting and Tires were closed. Local Bolt makers report some improvement in export orders, but domestic orders are still light and prices are weak. Prices in Finished lines are being firmly maintained, except on Sheets and Plates. One or two Plate mills are reported to be shading prices at least $2 a ton, but the majority of the mills are getting orders at the regular price. Warehouse business is still quiet. We quote Iron Bars at 1.45c., Cleveland, for car lots; Steel Bars, 1.50c., Cleveland, for car lots, half extras; Beams and Channels, 1.70c., base, Cleveland, and Plates, ¼-in. and heavier, 1.70c., Cleveland. We quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Jobbers quote Iron and Steel Bars out of stock at 1.65c. to 1.70c. Beams and Channels out of stock are 2c., and Plates, ¼-in. and heavier, 1.90c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.80c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 71 per cent. discount.

Old Material.—The market continues strong. Prices are about stationary except on Old Steel and Old Iron Rails, which are firmer. Dealers are still unwilling to sell, holding off for higher prices. The actual demand shows little im-

provement, although inquiries are slightly better for some kinds of Scrap. The activity during the week was mostly among dealers who had sold Steel Scrap short and were seeking to cover. The local rolling mills are still idle and are not in the market at present. An improvement is felt in the demand for Cast Scrap from foundries. A good demand for Turnings is reported, but the supply is scarce. Dealers' prices to the trade, per gross ton, f.o.b., Cleveland, are as follows:

Old Steel Rails	$14.00 to $14.50
Old Iron Rails	16.00 to 16.50
Steel Car Axles	17.50 to 18.00
Old Car Wheels	14.50 to 15.00
Relaying Rails, 50 lb. and over	22.00 to 23.00
Heavy Melting Steel	13.50 to 14.00
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.00 to 11.50
Light Bundled Sheet Scrap	8.00 to 9.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	6.00 to 6.50
Iron and Steel Turnings and Drillings	7.50 to 8.00
Steel Axle Turnings	8.50 to 9.00
No. 1 Busheling	11.50 to 12.00
No. 1 Railroad Wrought	13.00 to 13.50
No. 1 Cast	12.50 to 13.00
Stove Plate	10.00 to 10.50
Bundled Tin Scrap	8.00 to 9.00

Pittsburgh.

PARK BUILDING, July 29, 1908.—(*By Telegraph.*)

Pig Iron.—Inquiries are decidedly better, and in the past week a moderate tonnage has been sold. Some large consumers are feeling the market for their supplies for the balance of this year, but their ideas and those of the furnaces as to prices are as yet too far apart. The Standard Sanitary Mfg. Company is in the market for nearly 8000 tons of Foundry Iron, of which about 3500 is Southern, 500 Virginia, and about 4000 Northern. In the Mahoning and Shenango valleys the Youngstown Steel Company has blown out its Tod Furnace; Shenango Furnace Company has Nos. 1, 3 and 4 stacks in blast, but will blow out No. 4 early in August; Stewart Iron Company has one stack on Bessemer; Andrews & Hitchcock have one stack on Foundry; Dover, of M. A. Hanna & Co., is running on Foundry; Struthers is running on Basic, and United Iron & Steel Company has two stacks running on Bessemer and Basic; Ella Furnace, of Pickands, Mather & Co., will likely blow in this week. We quote Sand Cast Bessemer Iron at $15.65, Basic, at $15; Malleable Bessemer, at $15; No. 2 Foundry, at $14.50 to $14.75, and Gray Forge, at $14, all at Valley furnace, the freight rate to Pittsburgh being 90c. a ton. We note sales of 600 tons of Malleable Bessemer at $15; 500 tons of Standard Bessemer at $15.75, and 300 tons of Standard Bessemer at $15.65, all at Valley furnace. The output of the Mahoning and Shenango valleys is now running about 12,000 tons per week, and shipments are about the same amount. Stocks are reported to be about 51,000 tons.

Steel.—We note moderate sales of Billets and Sheet and Tin Bars at regular prices, and the tone of the market is reported firm. A fair amount of tonnage in Steel is being specified for against contracts, but shipments of Tin Bars by the mills are not so heavy as some time ago. We quote Bessemer and Open Hearth Billets, 3⅞ in. and larger, up to and including 0.25 carbon, $25; 0.26 to 0.60 carbon, $1 extra; over 0.60 carbon, $2 extra, all f.o.b. Pittsburgh. For Wheeling, Martins Ferry, Follansbee, Newcastle, Sharon, Steubenville and Washington (Pa.) delivery, half the freight or 50c. additional is charged. Sheet and Tin Bars in random lengths are $27, f.o.b. Pittsburgh. Forging Billets take $2 advance over Rolling Billets.

(*By Mail.*)

General conditions in the Steel trade are slowly but steadily improving, and there is more optimistic talk than has been heard for some time. As yet there is no heavy buying, orders being mostly for small lots for actual needs, but these are increasing. One large local Steel interest reports that its actual orders received Monday were larger in number and in tonnage than on any one day for over nine months. The leading Steel companies are operating to greater capacity, and this week the entire 60 open hearth furnaces at the Homestead Works of the Carnegie Steel Company are in operation, the first time this has been the case for some months. The Bessemer plants and finishing mills of the Republic Iron & Steel Company and the Youngstown Sheet & Tube Company are in operation to nearly full capacity. The Carnegie Steel Company is operating a larger number of its blast furnaces than at any time this year, and is getting more stacks ready to start up. Seven of the 11 Edgar Thomson stacks are in operation, their output of Bessemer Iron being used in the three Edgar Thomson Rail mills. Inquiries for Pig Iron are better and more is being sold than for some time. Prices, however, are only fairly strong, Bessemer Iron having declined squarely to $15.75 at furnace, while several sales have been made at $15.65 and even lower. In Structural Steel inquiries are reported as being better and the material for the Oliver Building has finally been placed. Plates have not shown much betterment and the demand for Tin Plate has fallen off, but Black and Galvanized Sheets are looking better. There is some movement in the Scrap market, and prices on Heavy Steel Scrap and Rerolling Rails have advanced about $1 a ton. The Coke trade is still dull and low prices have been made, which some of the larger operators are refusing to meet.

Ferromanganese.—We quote foreign 80 per cent. for balance of the year delivery at $44, seaboard, or $44.95, Pittsburgh, and note a sale of 100 tons for this delivery at the quoted price.

Ferrosilicon.—Not much inquiry is reported, and we quote 50 per cent. at $67.50 to $70, Pittsburgh.

Muck Bar.—The market on this material has been stagnant for a long time, but some business is expected to develop soon, as the result of the starting up of a number of Bar Iron mills that signed the wage scale. The quotation last week of $36, Pittsburgh, for best grades of Muck Bar made from all Pig Iron was a typographical error and should have been $26, Pittsburgh. On a firm offer, and for any large tonnage, it is probable that close to $25 could be done, as wages of Muck rollers were materially reduced when the recent scale settlement was made.

Rods.—The demand continues quiet, but prices are moderately firm. We quote Bessemer Rods at $33, Basic $34, and Chain Rods, $35, Pittsburgh.

Skelp.—The mills have little on their books, with not much new demand, and are not able to operate to more than half capacity, if that much. Nominal prices are as follows: Grooved Steel Skelp, 1.45c. to 1.50c.; Sheared Steel Skelp, 1.50c. to 1.60c.; Grooved Iron Skelp, 1.60c. to 1.70c., and Sheared Iron Skelp, 1.70c. to 1.75c., f.o.b. Pittsburgh.

Steel Rails.—A Southern railroad is reported to have placed a contract for 10,000 tons of Standard Section Rails, a part of which is expected to come to Pittsburgh, but this has not been officially confirmed. The Carnegie Steel Company is receiving better specifications against contracts, and last week took orders for over 2000 tons of Light Rails. Nos. 1, 2 and 3 Rail mills of the Carnegie Company, at Bessemer, are in operation, but are gaited to about 35 per cent. or less of capacity. Prices on Light Rails are higher, several mills stating that they have advanced quotations about $2 a ton. Prices on Light Rails, which are still being shaded $2 to $3 a ton, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—The general demand for Plates does not show much betterment, but the Carnegie Steel Company is still turning out a heavy tonnage of 22¼-in. Plates, which are shipped to the McKeesport Works of the National Tube Company, to be made into 6-in. Pipe for the Standard Oil Company. Prices on narrow sizes of Plates continue to be shaded by some mills to the extent of $1 to $1.50 per ton, but on the larger sizes it is stated that prices are being held. We quote Tank Plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.60c., base, at mills, Pittsburgh. Extras over this price are as follows:

Tank, Ship and Bridge quality, ¼ in. thick on edges, 100 in. wide, down to but not including 6 in. wide, is taken as base.

Steel Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, shall be considered ¼-in. Plate. Steel Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Steel Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. shall take the place of 3-16-in.

Percentages as to overweight on Plates, whether ordered to gauge or weight, to be governed by the Association of American Steel Manufacturers' Standard Specifications.

Gauges under ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Locomotive Firebox Steel	.50
Shell grade of Steel is abandoned.	
For widths over 100 in. up to 110 in	.05
For widths over 110 in. up to 115 in	.10
For widths over 115 in. up to 120 in	.15
For widths over 120 in. up to 125 in	.25
For widths over 125 in. up to 130 in	.50
For widths over 130 in	1.00

TERMS —Net cash 30 days. Pacific Coast base, 1.50c., f.o.b. Pittsburgh.

Structural Material.—More actual tonnage has been placed in the past week than in any similar period for some time. The contract for the erection of the Oliver Building has at last been closed, the material, about 10,500 tons, to be rolled at the Homestead Works of the Carnegie Steel Company. The American Bridge Company has taken the contract for building the approaches for the Kanawaha & Michigan Railroad, at Point Pleasant, W. Va., to the Ohio River, 2000 tons; also a viaduct for delivery near Buffalo, 1000 tons, and the contract for the May Building in this city, about 600 tons. Inquiries are reported better than for some time, and the Ambridge, Pa., shops of the American

Bridge Company are now being operated to greater capacity than for some months. There is still complaint that very low prices are being made for fabricating by the leading Structural interests. Efforts are being made to bring the fabricators in closer relations with each other, and several meetings for this purpose have already been held. We quote as follows, f.o.b. mill, Pittsburgh: I Beams, H Beams and Channels, 3 to 15 in., inclusive, 1.60c. net; Beams over 15 in., 1.70c. net; Angles, 3 to 6 in., inclusive, ¼ in. and up, 1.60c. net; Angles, over 6 in., 1.70c. net; Angles, 3 x 3 in. and up, less than ¼ in., 1.50c., base, half extras, Steel Bar card; Tees, 3 in. and up, 1.65c. net; Zees, 3 in. and up, 1.60c. net; Angles, Channels and Tees under 3 in., 1.50c., base, half extras, Steel Bar card; Deck Beams and Bulb Angles, 1.90c. net; Hand Rail Tees and Z-19, 3c. net; Checkered and Corrugated Plates, 3c. net.

Sheets.—Some improvement in the demand for both Black and Galvanized Sheets is reported, and this week the American Sheet & Tin Plate Company is operating 51 per cent. of its Sheet capacity, against 47 per cent. last week. Reports that prices on Blue Annealed Sheets have been reduced $1 a ton are officially denied. It is stated that regular prices are being well maintained, very little cutting being done. Prices for shipment from mill are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—This week the American Sheet & Tin Plate Company is operating 55 per cent. of its hot mill capacity, but we note that all of its tinning pots are in operation, the company having shut down a large number of hot mills owing to an accumulation of Black Plate. The demand for Tin Plate has fallen off recently, as it usually does at this season. Tin Plate prices continue firm, and we quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Hoops and Bands.—Little new business is being placed, but a moderate amount of specifying is being done on contracts. Regular prices are as follows: Steel Hoops, 1.80c., base, full Hoop card prices; Steel Bands, 1.40c., base, half Steel card extra, all f.o.b. cars, Pittsburgh, in carload lots, for delivery during 1908.

Iron and Steel Bars.—Specifications against the large contracts for Steel Bars placed in June are now coming in more freely, and as a result the Republic, Carnegie and Jones & Laughlin companies are operating to larger capacity in Steel Bars than for some time. The demand for Iron Bars is only fair, none of the Bar Iron mills being able to operate to full capacity. We quote Iron Bars at 1.40c., base, for Pittsburgh delivery, and 1.35c., base, for Western points, to which freight is added, except Chicago, the price for which is 1.50c., delivered. We quote Steel Bars at 1.40c., Pittsburgh, for base sizes.

Merchant Steel.—Implement makers are ordering a fair amount against contracts, and several of the Steel interests report that actual business being entered is larger than for some time, but still in small lots for actual needs. The demand for Shafting is dull, the low prices at which this material is selling failing to bring out any large orders. We quote: Cold Rolled Shafting, on contracts for 100 tons and over, 57 per cent. off; carloads, 56 per cent. off, and less than carloads, 52 per cent. off, on which carload freight is allowed within base territory. Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 1.90c. to 1.95c.; Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron, finished, 1½ in. and wider, 1.40c.; under 1½ in., 1.55c. Planished Tire Steel is 1.60c., all f.o.b., at mill.

Railroad Spikes.—A start has finally been made by the railroads in the buying of Railroad Spikes, but while no large contracts have been placed, some fair-sized orders have been entered by the mills, and the outlook is that more business will be placed in the near future, as several large railroads have inquiries in the market. We quote: Standard sizes, 4½ x 9-16 in., at $1.70, and the smaller sizes at $1.80 per 100 lb. in carload and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Spelter.—The market is slightly firmer, and it is reported that the volume of business is showing some betterment. A sale of 100 tons of Spelter for September, October and November delivery, has been made, at 4.32½c., St. Louis, or 4.45c., Pittsburgh, and we quote the market at that price.

Merchant Pipe.—New business is slowly but steadily increasing, and at present the leading Pipe mills that have Steel Works connections are operating to a little over 50 per cent. of capacity. Several large gas and oil line projects are in the market, but these are slow in developing, owing to difficulties in arranging satisfactory financial terms with the mills. Discounts on Steel Pipe, ¾ to 6 in., to the large trade are now 76 and 5 per cent. off list. Regular discounts are as follows:

Merchant Pipe.

	Jobbers, carloads, Steel.	
	Black.	Galv.
	%	%
⅛ to ¼ in.	67	51
⅜ in.	69	55
½ in.	71	59
¾ to 6 in.	75	65
7 to 12 in.	72	57
Extra strong, plain ends:		
⅛ to ⅜ in.	60	48
½ to 4 in.	67	55
4½ to 8 in.	63	51
Double extra strong, plain ends:		
½ to 8 in.	56	45

Discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
	%	%
⅛ to ¼ in.	65	..
⅜ in.	67	53
½ in.	69	57
¾ to 6 in.	73	63
7 to 12 in.	70	55
Extra strong, plain ends:		
⅛ to ⅜ in.	58	46
½ to 4 in.	65	53
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

Boiler Tubes.—This trade has been dull for a long time, but is now showing slight betterment, with indications that the railroads will soon be moderate buyers. Regular discounts on Merchant Tubes in small lots, on which an extra 5 per cent. is allowed in carloads, but which discounts are being shaded, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in.	42	47
1¾ to 2¼ in.	42	59
2½ in.	47	61
2¾ to 5 in.	52	65
6 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Iron and Steel Scrap.—Decided betterment is experienced in the Scrap trade, and prices all along the line have advanced from 50c. to $1 a ton. Heavy Steel Scrap and Rerolling Rails are now fully $1 higher than was quoted by dealers two or three weeks ago. A number of consumers of Scrap have come to the idea that prices are probably as low as they will go, and are now buying Scrap for future requirements. We note a sale of 1000 tons of a special grade of Heavy Steel Scrap, analysis being particularly severe, at $16.50, Pittsburgh. Dealers quote as follows per gross ton, f.o.b. Pittsburgh: Heavy Steel Scrap, for Pittsburgh, Steubenville and Sharon delivery, $14.50 to $15; Cast Iron Borings, $8.50; No. 1 Railroad Wrought Scrap, $13.75 to $14.25; No. 1 Cast Scrap, $14.25 to $14.75; Bundled Sheet Scrap, $11.50 to $12; Sheet Bar Crop Ends, $17.50 to $17.75; No. 1 Busheling Scrap, $13 to $13.50; No. 2 Busheling Scrap, $9.50 to $10; Iron Axles, $20 to $20.50; Steel Axles, $18.50 to $19; Low Phosphorus Melting Stock, 0.04 and under, $18 to $18.50; Old Steel Rails, short pieces, $14.75 to $15.25; Rerolling Rails, $15.50 to $16; Machine Shop Turnings, $8.75 to $9.25; Grate Bars, $12.25 to $12.50; Railroad Malleable Scrap, $13 to $13.50.

Coke.—The Frick Coke Company is increasing its operations, due to the blowing in of some additional blast furnaces by the Carnegie Steel Company, but as a rule the Coke plants are not being operated more than four or five days per week. Prices are not any better and some low figures are being made on Furnace Coke for spot shipment and for delivery over balance of this year. An Eastern furnace interest is in the market for 5000 tons of Furnace Coke per month for the rest of 1908, and we understand that some low prices have been made on this inquiry. The concern in question has some Coke ovens in West Virginia, but the quality of the product is not quite satisfactory and it has decided to buy some Connellsville Coke to make a better average. Another Eastern furnace interest has contracted for a fairly large tonnage of Furnace Coke for the rest of the year delivery at $1.65 at oven. We quote Standard Connellsville Furnace Coke for spot shipment at $1.50 to $1.55, and for rest of the year delivery at $1.65 to $1.75 at oven. Several operators are unwilling to sell their Furnace Coke at less than $1.75, claiming that any price below this is less than cost of making it. Connellsville 72-hour Foundry Coke is held at $2 to $2.25, but other grades can be had as low as $1.85 at oven. The output of Coke last week in the Upper and Lower Connellsville regions was 185,093 tons, an increase over the previous week of about 10,500 tons.

Buffalo.

BUFFALO, N. Y., July 28, 1908.

Pig Iron.—The week has shown a perceptibly progressing trend toward improvement, both as regards inquiries and sales, although the demand is not yet sufficiently active to cause any upward movement in prices. Quotations remain practically the same as for last week, as follows, f.o.b. Buffalo:

No. 1 X Foundry	$16.00 to $16.25
No. 2 X Foundry	15.25 to 15.75
No. 2 Plain	15.00 to 15.25
No. 3 Foundry	14.75 to 15.00
Malleable Bessemer	16.00 to 17.00
Gray Forge	14.75 to 15.00
Charcoal	20.00 to 20.50

Finished Iron and Steel.—In Structural Material and Finished Iron and Steel there is a better feeling, but the midsummer quiet is on, and no large orders are being placed—most of the work in hand being on small jobs only. Several contracts of considerable size have been figured on, but are being held for the present.

Old Material.—The market has been quiet and lethargic. Prices rule about the same as shown in previous report, with the exception of Scrap Pipe, which has advanced slightly. Quotations, per gross ton, f.o.b. Buffalo, are as follows:

Heavy Melting Steel	$13.50 to $14.00
No. 1 Railroad Wrought	13.25 to 13.75
No. 1 Railroad and Machinery Cast Scrap	13.50 to 14.00
Old Steel Axles	15.50 to 16.25
Old Iron Axles	17.75 to 18.25
Old Car Wheels	13.25 to 14.00
Railroad Malleable	12.00 to 12.50
Boiler Plate	11.50 to 12.00
Stove Plate	12.00 to 12.25
Grate Bars	10.50 to 11.25
Pipe	11.00 to 11.50
Wrought Iron and Soft Steel Turnings	7.00 to 7.50
Clean Cast Iron Borings	6.00 to 6.50
No. 1 Busheling Scrap	11.25 to 11.75

New York.

NEW YORK, July 29, 1908.

Pig Iron.—There has been a fair run of business in Foundry Iron, both in this district and in New England, without developing any movement in prices. We quote, at tidewater: Northern No. 1 Foundry, $16.75 to $17; No. 2 Foundry, $16 to $16.50, and No. 2 Plain, $15.25 to $15.50. Alabama Irons are quoted $16.50 to $17 for No. 1 Foundry and $15.75 to $16.25 for No. 2 Foundry.

Structural Material.—The most interesting development of the week was the placing of the contract for the erection of the Oliver Building in Pittsburgh, which will require about 11,000 tons of Steel. The Carnegie Steel Company will furnish the material. This contract has been pending for a long time, and the fact that it has now been placed indicates that Pittsburgh interests are taking a more hopeful view of the situation. Pittsburgh has naturally been the most depressed business center of the country, and it is noteworthy that sentiment is there undergoing a change. Other large contracts in various parts of the country are getting into position for being placed, and Structural Steel interests are confident that an improved demand will be felt from this time forward. The American Bridge Company was awarded 1900 tons of bridge work by the Toledo & Ohio Central. Milliken Brothers, Inc., secured a contract from the New Haven Railroad for 1000 tons of material, to be used for terminal work at Oak Point. It is stated that bids have been asked on 10,000 tons of Structural Steel for the Canadian Government, to be used for towers to support cables in transporting electric current generated at Niagara Falls. Bids are to be opened to-day on 500 tons for viaduct work for the Pennsylvania Railroad improvements in Long Island City. Much more business is now being done in furnishing Steel for small structures, such as factory buildings. For work of this character the inquiries are considerably larger than they have been for some time, but it takes quite a number of such orders to aggregate 1000 tons. An interesting local development is the increase in the number of small commercial buildings erected in various portions of this city. The demand for plain material is reported as much larger by the Steel companies and specifications on contracts are good. We quote on tidewater delivery, mill shipments, as follows: Beams, Channels, Angles and Zees, 1.76c.; Tees, 1.81c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2c. to 2½c.

Plates.—While the local demand is confined to small orders, their number has increased quite a little of late, and sales agents are feeling more encouraged. As far as can be learned, no contracts are yet being placed for future delivery, as consumers still hold to the opinion that prices are not likely to be advanced in the near future. The trade is anxiously awaiting the result of the bids to be opened on Friday for the large tonnage of Plates needed for the pipe line for the extension of the Brooklyn water supply. We quote for standard sized Plates as follows, at tidewater: Sheared Plates, 1.76c. to 1.86c.; Flange Plates, 1.86c. to 1.96c.; Marine Plates, 2.16c. to 2.26c.; Firebox Plates, 2.65c. to 3.50c., according to specifications.

Bars.—The demand for Bar Iron has been considerably heavier, and leading manufacturers state that they have sold a larger tonnage within the past two weeks than for the whole of the preceding five weeks. It is claimed that very little high-grade Bar Iron can now be secured below 1.46c., New York delivery. It is further stated that no long time contracts will be taken by the leading mills, at even this price. The stiffening in Old Material is naturally having its effect on Bar Iron prices. Some disposition is observed among merchants to contract for deliveries of Steel Bars, and the outlook in this direction is satisfactory. We continue to quote Steel Bars at 1.56c., tidewater.

Cast Iron Pipe.—The business placed in the past week has consisted of small lots of a few hundred tons each. We quote 6-in. Pipe at tidewater $23.50 to $24 per net ton.

Old Material.—All grades are in better demand, but particularly Wrought Iron Pipe, Heavy Cast, Stove Plate, Railroad Wrought and Heavy Melting Steel. The principal buying, however, has been done by parties who had sold for future delivery and have been rather actively covering their requirements. A number of Steel Scrap consumers are not only purchasing at ruling prices but express their willingness to pay 50c. per ton over present quotations for deliveries running through the balance of the year. The belief is general that bottom prices have been reached on Old Material and that all grades are stronger. In a few instances prices have already been marked up a little. We quote as follows, per gross ton, New York and vicinity:

Old Girder and T Rails for melting	$11.00 to $11.50
Heavy Melting Steel Scrap	11.00 to 11.50
Old Steel Rails, rerolling lengths	12.50 to 13.50
Relaying Rails	21.00 to 22.00
Old Iron Rails	15.00 to 15.50
Standard Hammered Iron Car Axles	16.50 to 17.00
Old Steel Car Axles	15.00 to 15.50
No. 1 Railroad Wrought	14.00 to 14.50
Iron Track Scrap	10.00 to 10.50
No. 1 Yard Wrought, long	12.50 to 13.00
No. 1 Yard Wrought, short	11.00 to 11.50
Light Iron	6.00 to 6.50
Cast Borings	5.50 to 6.00
Wrought Turnings	7.00 to 7.50
Wrought Pipe	10.00 to 10.50
Old Car Wheels	13.75 to 14.25
No. 1 Heavy Cast, broken up	13.00 to 14.00
Stove Plate	10.50 to 11.00
Locomotive Grate Bars	11.00 to 11.50
Malleable Cast	12.50 to 13.00

Ferroalloys.—Some resale lots of 50 per cent. Ferrosilicon are reported as coming out on the market. The unchanged price of $70 is quoted by both domestic and foreign producers, delivered to Pittsburgh points. The unchanged quotation of $44 likewise prevails for 80 per cent. Ferromanganese.

B. Nicoll & Co., Pig Iron merchants, Singer Building, New York, will open an office at Birmingham, Ala., on August 1. J. W. Porter has been placed in charge.

Metal Market.

NEW YORK, July 29, 1908.

Pig Tin.—Business continues light, although a slight improvement is noticeable. The shortage of Tin is becoming more acute, and prices have advanced sharply on this account. The largest advance was on July 23, when the initiative came in the way of higher cable advices from London. It is expected that deliveries into consumption this month will be about 2500 tons. The Verona, which is bringing 900 tons, ought to relieve the situation considerably, but it is reported that much of the Tin on this boat has already been sold. Price changes during the week have been as follows:

	Cents.
July 22	29.70 to 29.75
July 23	30.75
July 24	30.40
July 27	30.20
July 28	30.30 to 30.50
July 29	30.40

The arrivals so far this month have been 1737 tons, and there are afloat for American ports 1865 tons. The London market is about £2 higher than a week ago, closing at £137 10s. for spot, and £138 15s. for futures.

Copper.—The good buying noted a week ago has continued, and while the movement has undoubtedly been overestimated, it is the most important one in over a year. Prices have been advanced further, and to-day Lake is quotable, at 13.25c. Electrolytic is likewise firmer, at 13.07½c. to 13.15c. Sales of Electrolytic have been made at the inside figure, and 13.10c. has been refused for a round lot. Other sales later in the week commanded 13.12½c. Exporters are paying slightly over 13c. for such metal as they desire. The largest lake mining company has sold its product for August and September, and the same is true of a Southwestern producer. Selling agencies refuse to make concessions for later deliveries of copper; in fact, some of them are reported as unwilling to quote for later dates.

The advance in price, which is purely due to American consumptive demand, is having a strengthening effect on the London market, and prices for Standard warrants have advanced about £1, closing at £59 5s. for spot, and £60 for futures. The exports for the first 28 days of the month amount to 16,348 tons. While the present movement is an entirely legitimate one, it should not be overestimated. The General Electric Company reports an increase in business, and is figuring on some large contract work which will probably be placed in the near future as a result of easier monetary conditions. This company is now securing a regular supply of Copper from its Bully Hill Mining Company property in California. This week the first Copper from the Steptoe Reduction Works in Nevada is expected to reach the Atlantic seaboard, and this district will probably be producing at the rate of 40,000,000 lb. per year within six months.

Spelter.—No change is observed in the market, and business continues unusually quiet. Spelter can still be had in St. Louis at 4.35c., and in New York at 4.45c. It is probable that on a firm offer this New York quotation would be shaded.

Pig Lead.—The market is considerably stronger, with some sellers holding out for 4.60c. The American Smelting & Refining Company, however, continues to quote 4.50c. for shipment Lead in 50-ton lots. In other quarters spot Lead is quoted at 4.55c. The St. Louis market is firm at 4.40c. to 4.42½c.

Antimony.—Prices are again easier, but quotations are largely nominal at 8c. to 8.25c. for Hallett's, 8.25c. to 8.50c. for Cookson's and 7.75c. to 8c. for outside brands.

Nickel.—Quotations are without change at 45c. for ton lots and 50c. to 55c. for smaller quantities.

Tin Plate.—New business is rather light, but specifications against contracts continue to come in freely. Prices are absolutely without change at $3.89, New York, and $3.70, Pittsburgh, for 100-lb. IC Coke Plates. In Swansea Welsh Plates are unchanged at 14s. 4½d.

Old Metals.—Prices are higher, and the market is firmer, in sympathy with advancing quotations for Ingot Copper. The bulk of the business done this week was at the old figures, but several round lots have been disposed of at the new figures. The following dealers' selling prices are about ¼c. higher than last week:

	Cents.
Copper, Heavy Cut and Crucible	12.25 to 12.50
Copper, Heavy and Wire	12.00 to 12.25
Copper, Light and Bottoms	11.00 to 11.25
Brass, Heavy	9.00 to 9.25
Brass, Light	7.25 to 7.50
Heavy Machine Composition	11.50 to 11.75
Clean Brass Turnings	8.00 to 8.50
Composition Turnings	9.25 to 9.75
Lead, Heavy	4.10 to 4.20
Lead, Tea	3.75 to 3.87
Zinc Scrap	3.25 to 3.50

Copper Production in 1907.—The United States Geological Survey gives the production of Copper in 1907 at 387,945 gross tons, compared with 409,735 tons in 1906, 402,637 tons in 1905 and 365,740 tons in 1904. The apparent home consumption in 1907 was 217,755 tons, and in 1906 306,369 tons. The falling off in production in 1907 of about 5 per cent. was caused by the blockading of railroads in the early part of the year by snows and the shutting down of the Butte camp late in the year on account of low prices.

E. A. Caswell, 99 John street, New York City, has recently compiled a valuable chart showing the brands or ingot marks on all new ingot Copper refined in the United States. This chart is complete, and especially valuable to those using Copper of different brands, because at a glance the name of the mining company, the refinery, the ingot mark, and the form in which it is sold, are shown.

Iron and Industrial Stocks.

NEW YORK, July 29, 1908.

The stock market has maintained its strength, and in some instances new high records have been made for this movement. Some disposition was shown to regard unfavorably the President's criticism of the Standard Oil decision, but the effect of this fresh announcement of the position of the Administration was only temporary. The recovery was rapid, and prices speedily regained all loss. The range of prices on active industrial stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 44 to 45⅞, preferred 107½ to 109⅛; Car & Foundry common 38⅛ to 40, preferred 102 to 103; Locomotive common 52½ to 54½, preferred 105 to 106; Bethlehem Steel common 19 to 20⅝, preferred 48 to 50; Cambria Steel 35⅞ to 36½; Colorado Fuel 31 to 33¼; Crucible Steel common 6⅛ to 6¼, preferred 44¼ to 45⅛; Pressed Steel common 31¾ to 34¾, preferred 94 to 95; Railway Spring common 41 to 44½; Republic common 20¼ to 21⅝, preferred 72¾ to 74¼; Sloss-Sheffield common 60⅛ to 63¼; Cast Iron Pipe common 24 to 24⅞, preferred 70⅝ to 73; Can common 5¾ to 6⅜, preferred 60 to 61¾. A noteworthy incident was the sensational advance in the stock of the Westinghouse Electric & Mfg. Company, due to the belief that the plan for reorganization will be carried through successfully. On Wednesday of last week the common stock touched 89¼, showing an advance of 31 points for the week ending on that date. On Tuesday of this week it sold at 77 to 78⅞. The last transactions in active stocks up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 44¾, preferred 108⅝; Car & Foundry common 38⅞, preferred 102; Locomotive common 53¾, preferred 105; Colorado Fuel 32; Pressed Steel common 32¼, preferred 94½; Railway Spring common 45; Republic common 20⅝, preferred 73½; Sloss-Sheffield common 62½; Cast Iron Pipe common 24½, preferred 72; Can common 5¾, preferred 60.

The report of the Barney & Smith Car Company, Dayton, Ohio, for the year ending March 31, 1908, shows net earnings of $508,639, or $93,391 less than in the preceding year. Deducting charges of $100,000, preferred dividend of $200,000 and common dividend of $60,000, the remainder for surplus is $148,639, or $103,499 less than for the preceding year. The total of undivided profits March 31 was $474,163.

Dividends.—The J. G. Brill Company has declared the quarterly dividend of 1¾ per cent. on the preferred stock and a quarterly dividend of ½ per cent. on the common stock.

The Pressed Steel Car Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable August 26.

The Flannery Bolt Company, Pittsburgh, has declared a dividend of 5 per cent., payable August 1.

The Standard Roller Bearing Company, Philadelphia, Pa., has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable August 1.

The National Lead Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable September 15.

The United States Steel Corporation has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable August 31, and ½ per cent. on the common stock, payable September 30.

The Southern Steel Company's Affairs Progressing Favorably.—Under the plan of reorganization of the Southern Steel Company, which has now been assented to by practically all the bondholders, collateral trust noteholders and creditors, the Reorganization Committee of that company announces that it has made financial arrangements by which it has paid the overdue interest and sinking funds on the mortgages of the Georgia Steel Company, the Lacey-Buek Iron Company and the Chattanooga Iron & Coal Company. This action prevents the disintegration of these corporations by foreclosure suits and assures to the new company the ownership of valuable properties, consisting, among other things, of 35,000 acres of ore lands and rights and 37,000 acres of coal lands and rights, as well as thoroughly modern iron and steel works.

Nova Scotia's First Steel Ship.—The first steel vessel ever built by private enterprise in Nova Scotia has been launched from the shipyards of J. W. Carmichael & Co., New Glasgow, once the nursery of wooden shipbuilding in the palmy days of Nova Scotia's shipping. This schooner, the James William, has been under construction for seven or eight months. The new vessel's tonnage will be about 500. The hull is of steel, and most of the material was produced in Nova Scotia, the remainder being imported from Great Britain. The rivets were all made in Dartmouth, N. S., and the rope for the rigging all came from the same town. The sails were made in Yarmouth. The vessel has been built without Government subsidy of any sort.

William C. Coffin, Robert A. McKean and Samuel N. Riter, former officials of the Riter-Conley Mfg. Company, Pittsburgh, have formed the Coffin-McKean Company, and are now completing arrangements for incorporating under a Pennsylvania charter. The company is located at 828 Fulton Building, Pittsburgh, and will act as contracting engineer for the erection of blast furnaces, steel works, oil refineries, power and hydro-electric plants, industrial works and all forms of iron and steel construction.

The Machinery Trade.

NEW YORK, July 29, 1908.

With machinery houses business keeps up to the level of the past two months, there being so slight a difference in the average of the monthly transactions that neither a marked increase nor demand is noticeable, except in a few instances when spurts of activity have occurred in special lines of products. The maintenance of a fair business, about 50 per cent. of normal, during the usually quiet summer months, with a tendency toward a more active demand, is encouraging. In the past few weeks new projects of magnitude were more numerous, and while they show signs of early consummation, it is probable that a month or two must elapse before the purchases of machinery will be taken up. For plant extensions or equipment replacement the inquiries and orders received the past week were generally for small lots; no important specifications were reported. The railroads have thus far come into the market only in a small way, and the large industrial plants are doing but little buying. Considerable interest has been aroused in the trade by the report that a large powder company is to erect a new plant for the manufacture of cartridges.

The Board of Governors of the Machinery Club of the city of New York has elected W. P. Pressinger of the Chicago Pneumatic Tool Company secretary of the organization, and Charles A. Schieren, Jr., of the Charles A. Schieren Company, treasurer. Mr. Schieren will continue as a member of the House Committee.

New Car Plant for New Orleans.

The International Car Company, Louisiana Bank & Trust Building, New Orleans, La., recently incorporated, with a capital stock of $350,000, will erect modern shops for the building and repairing of cars, coaches, locomotives and railroad equipment. It is the intention to install a complete motor driven plant and the company will be in the market for a complete line of woodworking machinery, ironworking machinery, boiler, engine, dynamo, motors, &c. Plans for the new buildings have not been prepared and specifications for the required mechanical equipment have not yet been made up. As the company has a lot of urgent work on hand which must be turned out at once, it is the intention to erect temporary structures as soon as possible and begin work as soon as the machinery can be installed. Consequently the company will likely come into the market shortly for the equipment. The plant will give employment to about 400 men and the yards will have 3 or 4 miles of trackage. C. A. Ralston of Ralston & Le Baron, dealers in railway equipment, Chicago, Ill., is president; A. T. Le Baron of Ralston & Le Baron, vice-president and general manager; J. C. Flett, mechanical engineer, New York, secretary; A. Wagatha, vice-president of the Teutonia Bank, New Orleans, La., treasurer. The directors include Seely Dunn, manager of the Southern Car Service Association; J. E. Conley, president of the Conley Switch & Frog Company, Memphis, Tenn.; E. C. Roddie, master mechanic of the Illinois Central Railroad terminal, New Orleans, and John O. Osborn, Iowa City, Iowa. C. A. Ralston, president, is also the head of the McKeen Motor Car Company, Omaha, Neb., which was recently organized to build the gasoline motor cars now in use on the Harriman lines, reference to which was made in these columns last week. This latter company is, we understand, also to erect a large plant. These two large undertakings will necessitate the purchase of a great deal of mechanical equipment, and from the connection with railroad interests through the president it is evident that the propositions will be carried forward without delay.

The business of S. R. Sargent & Son, Castleton, Vt., has been consolidated with that of Osgood & Roundy, Randolph, Vt., under the name of the Sargent, Osgood & Roundy Company, which has been incorporated with a capital stock of $50,000. The company will manufacture a full line of farm implements, carriages and harness, and will do general foundry work. To replace the buildings of S. R. Sargent & Son, which were recently destroyed by fire, a modern fireproof factory building will be erected on a site with water power, for the equipment of which an engine lathe, bolt cutter, drill, wood boring machine, planer and possibly some other machine tools will be purchased. It has not yet been ascertained just what machinery was destroyed by the fire.

Charles Hagan, Winchester, Ky., who is to establish a machine shop 40 x 65 ft., is in the market for new equipment, including lathes, a drill press, planer, shaper, hack saw, forge and gas engine.

The Non-Explosive Safety Naphtha Container Company, 509-515 West Fifty-sixth street, New York, has taken over a plant which it expects to have in operation in October, manufacturing safety and nonexplosive devices under the McNutt patents. The company is in the market for machinery for equipping the new plant, the acquisition of which was necessary to provide facilities for taking care of its increasing business.

The Frevert Machinery Company, New York, has received a good order for machines from the Vermont Copper Company, Pompanoosuc, Vt., and one from another copper company.

In the past two weeks the demand for air compressors built by the Chicago Pneumatic Tool Company has considerably improved. Recent sales of large compressors include Philadelphia & Reading Railroad, Geiser Mfg. Company, Waynesboro, Pa.; Otis Steel Company, Cleveland, Ohio; National Tube Company, and Pusey & Jones, Wilmington, Del.

Power Plant Requirements.

The Tampa Electric Company, Tampa, Fla., has awarded a contract to the Stone & Webster Engineering Corporation, Stone & Webster Building, Boston, Mass., for enlarging its main power station on West Jackson street, Tampa, Fla., and for making numerous improvements in the light and power service of the city. An addition to the present building will be made to accommodate two turbine units, with all necessary steam and electric auxiliaries, in addition to the present equipment. One turbo-generator of 1500 kw. capacity, arranged to generate current at 2300 volts, with a 520-hp. water tube boiler, will also be installed. The present overhead lighting service of the company carries 133-cycle current, and these circuits will be reconstructed for 60-cycle current and will be extended. The work planned will cost in the neighborhood of $25,000.

J. G. White & Co., 43 Exchange place, New York, have inquiries in the market for about 600 kw. of power for the Wilkes-Barre Electric Company, one of the interests in the Wilkes-Barre District, of which J. G. White & Co. are engineers. It is understood that considerable improvements are contemplated to the traction and lighting properties in that territory and additional purchasing can be looked for shortly.

Frederick Loeser, Fulton street, Brooklyn, N. Y., is purchasing machinery for a power house and storage warehouse, including 300 kw. of power equipment, pumps and other power accessories as well as elevators, &c., for the warehouse.

The Board of Water Commissioners of Trenton, N. J., will receive bids until August 12 for a 20,000,000-gal. vertical triplex expansion crank and flywheel pumping engine for the water works pumping station.

The New York Board of Water Supply will receive bids until September 1 for the construction of another section of the Catskill aqueduct, which includes the construction of 3 miles of concrete conduit. This section will connect with the Walkill Valley siphon and the estimated cost is about $1,300,000.

The State Department of Public Works, Albany, N. Y., has approved contract No. 20, for the dredging of the Mohawk River for Barge Canal work. The work is estimated to cost $4,173,000. A contract for the erection of a large dam in the Mohawk River above Rome was also approved, the cost of the proposed work being estimated at $1,015,000. Bids for both contracts will shortly be advertised. Awards were made July 24 for contracts Nos. 60 and 64 to the Empire Engineering Company, New York, at its bid of $1,349,084 for the former and $1,200,492 for the latter work. Both amounts were a little in excess of the engineer's estimate.

Business Changes.

Wilkes McClave, formerly a member of McClave-Rimmer & Co., 90 West street, New York, with associates, has formed the Central Foundry & Machine Company, which will succeed to the business of the High Point Machine Company, at High Point, N. C. The new company, of which Mr. McClave has a controlling interest, has an authorized capital of $50,000, with $15,000 fully paid in, and starts business entirely free and clear of debt, with a comfortable working capital. E. W. McClave is president and Wilkes McClave is secretary and treasurer, they controlling 140 shares of the 150 shares issued. The company manufactures steam engines, sawmills, lathmills, box machinery, shingle machinery, bobbin lathes, centrifugal pumps, pulleys, hangers, &c., and will carry a general line of mill and factory supplies. The business has been established for over 20 years, first as the High Point Machine Works and later as the High Point Machine Company, and has a well equipped machine shop, foundry, pattern and woodworking shop. Peter B. Rimmer, the other member of the firm of McClave-Rimmer & Co., has opened an office in Wilkes-Barre, Pa., to sell Ridgway engines in the coal district, and the Ridgway Dynamo & Engine Company, whose agency McClave-Rimmer & Co. had in New York, will continue its New York office.

McLaughlin Brothers, Inc., building construction and engineers, removed July to their own building, 915 to 927 Bolton street, Baltimore, Md.

Chicago Machinery Market.

CHICAGO, ILL., July 28, 1908.

The machinery trade in general exhibits no features of marked interest, or any indications pointing to an immediate change in existing conditions. Whether the trend is toward lasting improvement is hard to determine in view of the ups and downs which have characterized the course of demand in the past six months or more. During this period, it is true, the range of fluctuation has been confined to extremely narrow limits, and has been lacking in uniformity, but at times there have been upward turns which gave rise to hopes of permanency. Thus far, however, such hopes have failed of realization, for on each occasion reaction has quickly demonstrated the temporary nature of these incipient signs of forward progress, with the result that the market has soon relapsed into its former state of comparative somnolence. But in view of the serious nature of the difficulties encountered through the combined influences of financial and industrial depression, it is a matter of congratulation rather than otherwise that the machinery trade has not been reduced to even narrower limits than it has, since no industry is more keenly susceptible to such untoward effects. The strongest factor operating to prevent utter stagnation in this market has undoubtedly been the relatively unimpaired activity of the smaller shops and factories of the West. From these sources have come no individual orders for large equipment, such as in ordinary times are not infrequent, but they have nevertheless yielded an amount of business which, though widely scattered, has been and continues to be of considerable importance in the present state of affairs. Last week's transactions in machine tools included but a small volume of business, made up of incidental orders comprised principally of single tools. What inquiries there are in the market are of like nature, and so far as can be learned there are no prospective deals of importance in sight promising early closure. While it was hardly expected that there would be any general buying of new tool equipment by the railroads, it was freely predicted some weeks ago that by this time more orders representing urgent shops needs would begin to appear. Up to this time these forecasts have not only failed of fulfillment, but there are no indications affording a certain basis for their early renewal. Some of the leading builders of electrical machinery report a slowly increasing demand for motors, generating sets and accessories, as well as a more extended line of inquiries. Among the latter are a number that relate to prospective traction power house projects which are as yet unfinanced and awaiting more favorable conditions for their development. Of those which concern equipment for isolated lighting and power plants in public buildings, factories and private residences a greater proportion result in direct orders.

Among manufacturing plants none are perhaps quieter at the present time than the car shops. Yet, notwithstanding, a few new enterprises of this character are being organized, and some extensions and improvements of present plants are being undertaken with the view of providing proper facilities for the economical handling of a larger volume of business which will surely follow the ultimate resumption of railroad buying. An instance of such expansion is noted in the improvements being made by the Western Steel Car & Foundry Company, Chicago, which is extending its main building by the erection of a steel structure which will add 500 ft. to its length. A new paint shop, 40 x 140 ft., is also being erected. When these additions are completed they will bring the capacity of the plant up to a basis of 75 cars per day. The purchase of some new tools will be necessary for the equipment of these shops.

A new machine shop equipped with suitable machinery for general contract and job work will be built at Green Bay, Wis., by Carl Hartman. The shop will be of brick, 32 x 80 ft., and will be served with a traveling crane covering its entire length. The tools and machinery will be driven by two 5-hp. motors attached to two line shafts, one driving the light and the other heavy machines.

As an instance of the moderate improvement that is beginning to appear in some lines of machinery, it is noted that a larger number of inquiries from foundries, railroads, boiler shops and bridge works for pneumatic tools and appliances are being received by the makers of pneumatic tools and appliances. The Independent Pneumatic Tool Company, Chicago, is increasing the force of workmen at its Aurora plant, and states that more orders for pneumatic tool equipment have been entered in the first two weeks of July than during any similar period since last October. This fact, in conjunction with the apparent interest manifested in inquiries, is regarded as the forerunner of a steadily increasing trade in coming months.

A new asphalt plant to be erected by the M. H. McGovern Company on Twenty-one place, near Shroop street, Chicago, will require an estimated expenditure of $75,000. The plant will be equipped with modern machinery for the treatment and handling of asphalt, and will have a dock frontage at slip A on the south branch of the Chicago River.

For the improvement of its water and light plant the city of Fort Morgan, Colo., is preparing to expend $55,000 for the purchase of new equipment, bids for which will be received up to August 4. The machinery required will include a heavy duty high grade four valve engine, direct connected to a 100-kw. A. C. 60 cycle two phase 2200 volt generator, together with exciter, switchboard and all necessary accessories.

Sealed proposals will be received until August 12 by the treasurer of the Central Branch, N. H. D. V. S., National Military Home, Ohio, for the construction of an addition to the central power house, together with necessary equipment. Specifications and detailed information may be had upon application to W. H. Ortt, treasurer.

The present ice and cold storage plant of W. E. Llewellyn, Sterling, Ill., will be practically doubled by the installation of new machinery equipment and the extension of buildings. The new building will be 109 x 150 ft., and an additional well 1600 ft. deep expected to give a flow of 60 gal. per minute is being put down.

Proposals for furnishing material and constructing a power plant for the municipal electric lighting system will be received by the city of Hartford, Wis., until August 7. The proposed improvement includes the construction of a brick power house to house the power equipment consisting of two steam engines and two steam boilers, or in lieu of these a gas producer plant; two electric generators of the alternating type with switchboards, street lamps, transformers, regulators, &c., will be required to complete the power house installation. Detailed information concerning the work may be had upon application to A. T. Maltby, engineer, Great Northern Building, Chicago, Ill.

Arrangements are being made by the city of Waterloo, Ill., to move the municipal electric light plant from its present site, 2 miles out of the city, back into town. The contract for this work has been let, and bids are asked until August 3 for two 72 in. by 16 ft. high pressure return tubular boilers for installation at the new location.

The Hanna Engineering Works, Chicago, Ill., has added to its line the entire riveting business of the Quincy, Manchester, Sargent Company, Plainfield, N. J., including the full assortment of the Pedrick & Ayer hydro-pneumatic, plain toggle American riveters, pneumatic punches, &c., which it is now prepared to offer to the trade in a variety of styles and sizes to meet the most exacting conditions, and fill the desire of such manufacturers as have a preference for a particular style of machine.

Cleveland Machinery Market.

CLEVELAND, OHIO, July 28, 1908.

No change occurred in the condition of the local machinery and machine tool market during the past week. Dealers' sales were limited to a few single tools and their inquiries are very scarce. While not much business was expected during the summer months, the outlook for any marked increase in sales in the fall is as yet not very promising. While business with the machinery and machine tool builders has improved only slightly, inquiries are considerably more plentiful. There is a feeling that the period of depression is near an end and prospective purchasers of machinery are looking around. They say that they are not yet ready to buy, but want to investigate and decide what tools they want with the view of placing orders as soon as business does pick up sufficiently to warrant the purchase of new equipment. There is an improvement in inquiries for heavy machinery for coal handling plants and other installations, but new projects of this nature are all dragging along and some that were expected to be closed several weeks ago are still pending. Everybody seems to be waiting for a further revival in business before placing orders. One project for building an ore handling plant at a Lake Erie dock is under consideration. Engineering firms report some improvement in preliminary inquiries regarding construction work requiring machinery equipment. Several projects of this kind, however, that have been pending for some time are still being held up.

While the majority of manufacturers report an improvement in orders, the gain in volume is still very slight. There is a strong feeling, however, that there will be a slow but steady improvement from now on. The automobile industry is fairly active and some of the local plants have put additional workmen on during the past few days. The demand for machine tools seems to be better among the automobile makers than from any other class of purchasers. Makers of automobile parts continue to be fairly busy. Makers of pneu-

matic tools report orders very light, with no prospects of an improvement in the demand in the early future.

The supply of second-hand tools in the hands of dealers has increased slightly, although their stocks of used tools are not large. A little more activity is noticed in the second-hand tool market.

Following a slight gain for a few weeks, the jobbing foundry situation is very quiet. Orders are being placed for only small lots of castings for immediate needs, and the competition for the small volume of available business is resulting in a great deal of price cutting.

The Reeves Bros. Company, Alliance, Ohio, maker of boilers, cement machinery, &c., recently built an addition to its plant and is now in the market for the necessary machine tool equipment. The company has inquiries out for a boring mill, planer, universal cutter and drill grinder, radial drill and five lathes, 14, 16, 20, 32 and 48 in.

The Republic Belting Company, Cleveland, reports a very satisfactory improvement in orders and inquiries for belting. The company has just secured the largest equipment order ever placed on its books. It came from a lumber company in Mississippi and amounts to about $10,000. It will take one and one-half carloads of leather to fill the order.

The American Shipbuilding Company has secured a contract from the Mesabi Railway Company for a fire boat to be used in protecting the dock property of the company at the head of the lakes. The boat will be 125 ft. long, 30 ft. beam and will cost about $150,000. It will probably be built at Cleveland or Lorain.

The Salem Electric Light & Power Company, Salem, Ohio, will erect a new plant, plans for which are being prepared by Wheeler & Richards, mechanical and electrical engineers, Youngstown. Two 250-hp. engines will be installed.

The Board of Public Affairs, Cuyahoga Falls, Ohio, has awarded contracts for rebuilding the municipal lighting plant in that place. The Crocker-Wheeler Company, Ampere, N. J., was given the contract for the generator, exciter and switchboard. A new engine will be furnished by the Shepard Engine Company, Williamsport, Pa.

The Pay-enter Fare Box Company, Cleveland, has been incorporated, with a capital stock of $10,000, to make fare boxes for street cars, by M. C. Mulhall, A. L. Welch, E. F. Archer, G. A. Howells and C. H. Judkins.

The Lorain Engineering & Construction Company, Lorain, Ohio, has been incorporated, with a capital stock of $10,000, by F. J. Penny, L. M. Penny, Minor Corron, G. C. Penny and E. P. Carron.

The National Foundry Company, Akron, Ohio, has been incorporated, with a capital stock of 10,000, by H. J. Emerman, Louis Abram, B. Emerman, M. Abram and M. B. Abram.

The Palmer-Hawkins Rubber Tire Company, Akron, Ohio, has been incorporated, with a capital stock of $100,000, to place on the market a new sectional tire for heavy trucks.

Cincinnati Machinery Market.

CINCINNATI, OHIO, July 28, 1908.

Sentiment in this machinery manufacturing center is just now not altogether unanimous as to the meaning of the undeniable improvement in inquiry and the stronger undertone to the nominally lagging machinery markets of July. It is felt by the ultra-conservatives that there can be little real permanent and stable improvement until after the election, that the several important sales of July's first two weeks mean nothing more than the coincidental buying of some badly needed tools, and that these supplied, the machinery markets will settle again into the apathetic conditions of the year's first half, with strong possibilities of more listless conditions than have yet been experienced this year.

Others belonging to the liberal side and conspicuously identified with the "sunshine" movement which was inaugurated here the first of July believe that there will be some steadily increasing buying of tools and machinery needed for the shops, particularly the railroad shops, into which hundreds of empty cars are now being rushed for much needed repairs, and that this will encourage others along similar lines needing new and additional tools. The second-hand machinery market is very quiet. Most dealers have plenty of used machines on the floor and are making good concessions to move them, realizing that a sudden brightening of the trade horizon will direct attention to the new machines, plenty of which are, as a rule, to be found on stock floors or at manufacturers' establishments ready for practically immediate delivery.

The daily press of the city is just now filled with matter of a highly sensational nature, tending to show a rapid return to normal conditions in manufacturing and citing many interviews, and this is being used in connection with the flooding of the territory with "sunshine" literature. While much improved conditions can be noted at the establishments manufacturing electrical power units, bakers' and sheet metal workers' machinery and the like, they are not so pronounced with the tool builders. There is a very good feeling among makers of milling machines, planers and shapers, and the conditions noted last week as indicating an improvement in these establishments are as marked this week, the early mails of the current week carrying quite as much new business for the order books as was placed last week and for the preceding one.

A second order within a comparatively short time for a 48-in. lathe and several orders for smaller tools have convinced one of the larger local establishments that there is a gradually increasing re-employment of labor in the larger shops. A large local concern making planers has recently made some splendid foreign shipments, but of a scattering nature; for instance, a late shipment carried important names in Germany, India, South America and Holland. A special machine recently shipped from this market cost the purchasers $7000. The Canadian Pacific Railroad is said to be buying and a $5000 contract for drills is expected to be landed by a Cincinnati establishment ere another week.

The foundries are taking on a few more men and those manufacturing miscellaneous castings are not far from normal; for instance, one of the largest local foundries is running five heats a week, taking off 15, 17 and 18 tons a day. This company usually sells about 500 tons of castings a month. Aside from the manufacturers of milling machines, planers and drills, local toolmakers have not begun ordering castings.

C. L. Morckel and H. P. McIntosh, formerly of Galion, Ohio, have organized the Ashland Iron Works Company, at Ashland, Ohio, and will operate a general jobbing foundry. Their plant is located adjacent to the works of the Ashland Steel Range Company.

Manager Neal of the National Steel Casting Company, at Montpelier, Ind., advises that the newspaper report that his company was shut down because of a lack of orders was erroneous; that the establishment has been continuously in operation, but for several months with less than half force. He believes there is a better feeling abroad.

Northern Indiana manufacturing interests are awaiting the final developments of the $900,000 company organized for the reclamation of old rubber by a secret process. The company, which was recently incorporated, has purchased the site of the Mishawaka Hydraulic Company, at Mishawaka, Ind., consisting of 10 acres on the north side of the river, and will erect a large plant. Four high power water wheels will be put in to utilize water power in the vicinity.

The Wabash Foundry & Machine Company, Wabash, Ind., has dissolved.

James Goldberg of Cincinnati has purchased the old boilers and machinery in the various water works stations in that city, his bid of $17,967.50 having been accepted by the Board of Public Service. All machinery must be removed by December 1.

Encouraging reports come from the Atlanta tin plate mill at Noblesville, Ind. After an idleness of 10 weeks the mill started up the middle of the month, and on a gradual readjustment of the machinery and increasing orders has made great strides toward normal conditions.

Philadelphia Machinery Market.

PHILADELPHIA, PA., July 28, 1908.

While no marked improvement has occurred in the demand for tools or machinery in the local market the past week, there have been a few more sales, and the trade feels more encouraged regarding the future. The slight general improvement to be noted in general business recently, and the reports that some plants will shortly be operated at increased capacity, are looked upon as favorable indications for at least some resumption of buying in the machine tool lines. The market is stronger sentimentally, and the trade believes that as soon as the railroads become active buyers there will be a general resumption, gradually leading to more normal business conditions. The circulation of extremely optimistic reports, without basis of fact, is not looked upon as a favorable policy. The machine tool trade is gaining slowly and steadily, and it would be to the best interest of the trade to have this improvement maintained, as hardly any branch of the trade is so situated as to be able to handle promptly and satisfactorily any sudden heavy rush of business. We can hardly return to the normal condition without considerable preparation, as plants which have long been operated on a much restricted basis will require pretty careful overhauling before they can go on a full time basis, and while in many cases operating forces and organization have been maintained in part, it will require time to get working forces operating in proper shape for economical and rapid production. If, therefore, we can return slowly to the normal, the trade believes that business could be best taken care of, and it is the general opinion that while an improvement will be noted during the coming fall months, it will

require a much longer period to enable the trade to get back to normal conditions.

Manufacturers note a spotty improvement in the demand. Here and there some fairly good orders have been booked, but they are irregular and in the aggregate do not enable tool makers to increase with any regularity their working forces or production. The greater part of the business is individually small, although there has been some fair sized business placed for special tools. The situation is viewed quite hopefully, however, and it is believed that with even the partial resumption of some of the industrial plants there will be a tendency toward increased buying of machine tools. Inquiries are reported as somewhat better, but continue to be confined largely to single tool propositions. Some few, taking in more extended equipment, are under consideration, but develop slowly.

Second-hand machinery merchants report a fairly good run of business. The demand is not heavy, but enough develops to keep things moving along satisfactorily. Both metal and woodworking tools, particularly of the medium and smaller classes, find a pretty good sale, and there is a moderately active demand for equipment of a somewhat special nature. Second-hand engines and boilers are not active, although some fresh inquiries for equipment of the medium powers are reported.

Little improvement is seen in the foundry trades. Here and there somewhat better orders are reported, but gray iron foundries particularly are not greatly increasing their output. Jobbing foundries continue dull, and but little improvement is to be noted by those making a specialty of machinery castings. Some of the steel casting plants show a little more activity, but the business taken is nearly all for prompt shipment, there being no disposition on the part of users of castings to anticipate their requirements.

The city of Salem, N. J., will expend about $10,000 on improvements to its water works. Particulars may be obtained from W. B. Dunn, city recorder, Salem, N. J., or George Pfeiffer, engineer, Merchantville, N. J.

The Horace B. Deal Company has been awarded the contract to erect the new fuse and primer shop for the Government at the Frankford Arsenal in this city. The building will be 50 x 200 ft. and be constructed of steel and reinforced concrete.

Sealed proposals will be opened August 12 by the Water Commissioners of Trenton, N. J., for building and erecting a pumping engine, together with all necessary work and appurtenances. The engine is to have a daily capacity of 20,000,000 gal. Particulars may be obtained from the Board of Water Commissioners or Charles A. Hague, consulting engineer, Trenton, N. J.

It is understood that the Bloomsburg & Milville Street Railway Company, Bloomsburg, Pa., has placed a contract for the construction of 12 miles of track with Lawrence & Co., Chicago, Ill. The road will be operated, it is said, with Strang gasoline motor cars.

The city of West Chester, Pa., has under consideration the construction of a sewage system and a disposal plant. A committee appointed to make the necessary investigations has reported that a suitable plant will cost about $125,000.

Proposals for preliminary work in connection with the new Passyunk avenue bridge over the Schuylkill River were opened by the Department of Public Works, Philadelphia, a few days ago. The work embraced the construction of five land piers on pile foundations. Bids were also opened at the same time for a concrete bridge on the Tabor Branch of the Philadelphia & Reading Railroad over Belfield avenue. Bids for this bridge range from $47,390 to $67,627. The awards in either case have not yet been announced.

Government Purchases.

WASHINGTON, D. C., July 28, 1908.

The Isthmian Canal Commission will receive bids until August 17, Circular No. 457, for shop machines, pumps, jacks, and a quantity of supplies.

Proposals will be received until August 6 at the office of the building for National Museum Library of Congress, Washington, D. C., for the water tube steam boilers for the power plant and fans and motors for ventilation.

The Isthmian Canal Commission will soon ask bids for a quantity of jacks of various sizes, six complete rock drills, &c.

The following bids were opened July 21 for machinery for the navy yards:

Class 71.—One hand power single I-beam overhead traveling crane—Bidder 6, Alfred Box & Co., Philadelphia, Pa., $357; 7, Brown Hoisting Machine Company, New York, $710; 14, Cleveland Crane & Car Company, Wickliffe, Ohio, $395; 19, Fairbanks Company, New York, $547; 20, Frevert Machinery Company, New York, $478; 26, G. & W. Mfg. Company, New York, $513; 28, Hoisting Machinery Company, New York, $480; 29, Handlan-Buck Mfg. Company, St. Louis, Mo., $515; 51, Northern Engineering Works, Detroit, Mich., $465; 52, Niles-Bement-Pond Company, New York, $622; 58, Reading Crane & Hoist Works, Reading, Pa., $390; 62, Shepard Electric Crane & Hoist Company, Montour Falls, N. Y., $341.50; 76, Vermilye & Power, New York, $547.75; 89, George S. Fowler, Washington, D. C., $553.82; 100, Case Mfg. Company, Columbus, Ohio, $532.

The following bids were opened at the Bureau of Yards and Docks, Navy Department, July 11, for the construction of a coal and ash handling plant at the navy yard, Philadelphia, Pa.:

Item 1, price for coal and ash handling plant complete; 2, price for coal handling and storage plant alone; 3, price for ash handling and storage plant alone; 4, same as item 1 except that the capacity of coal handling plant shall be 20 tons per hour and the ash handling plant 10 tons per hour; 5, same as item 2 except that the capacity of coal handling plant shall be 20 tons per hour; 6, same as item 3, except that the capacity of the ash handling plant shall be 10 tons per hour.

Phil Lauthe Construction Company, Chicago, Ill., item 1, $49,850; Hoisting Machinery Company, Philadelphia, Pa., item 1, $36,300; alternates, $32,400 and $29,450. Snare & Triest Company, New York, item 1, $34,498; alternates, $32,698 and $38,411; 4, $31,973. Burgin Point Iron Works, New York, item 1, $29,912; alternates, $29,089, $29,652 and $28,729; 4, $27,221; alternate, $26,398. Darley Engineering Company, New York, item 3, $12,840; alternate, $12,285; 6, $9537; alternate, $8499. Belmont Iron Works, Philadelphia, Pa., item 1, $37,750; alternate, deduct $1000; 2, $26,600; alternates, deduct $1000 and $1300; 4, $35,750; alternate, deduct $1000; 5, $25,580; alternates, deduct $1000 and $1050. Penn Bridge Company, Washington, D. C., item 1, $35,370; alternates, deduct $600 and $1000. Conveying Machinery Company, New York, item 1, $33,364; alternate, deduct $2000, $1500, $800 and $210. Link-Belt Company, Nicetown, Philadelphia, Pa., item 1, $39,370; 2, $35,440; 4, $35,490; 5, $31,560; alternate on all of the above, add $890; alternates on items 1 and 2, deduct $500; alternates on items 4 and 5, deduct $620. Edward F. Fonter, Philadelphia, Pa., item 1, $28,884; 2, deduct $600.

Bids for one 50 hp. boiler for pumping station at Fort Terry, N. Y., were received July 18, as follows:

E. Keeler Company, Williamsport, Pa., $1598. William D. Ahern, New London, Conn., $1742. Henry H. Morgan, New London, Conn., $2127. Dover Boiler Works, Dover, N. J., $1450. Donegan & Swift, New York, $1539. G. & W. Mfg. Company, New York, $1343. Speirs Bros., New London, Conn., $2275.

Under bids opened June 25, Circular No. 345, for supplies for the barracks at Jeffersonville, Ind., the Crescent Machine Company, Leetonia, Ohio, has been awarded contract for one planer, matcher and molder, at $270, and the American Wood Working Machinery Company, Rochester, N. Y., one railway cut-off saw, $200.

Under bids opened June 22, Circular No. 445, for supplies for the Isthmian Canal Commission, the Detroit Hoist & Machine Company, Detroit, Mich., has been awarded, class 2, pneumatic geared hoists, $999.50.

The following awards have been made for machinery for the Isthmian Canal Commission, bids for which were opened May 18, Circular No. 438:

Niles-Bement-Pond Company, New York, class 2, one steam hammer, $1226; class 3, one radial drilling machine, $1499; class 8, one universal crank shaper, $725.

Motley, Green & Co., New York, class 4, one planer, $1310.

Vandyck-Churchill Company, New York, class 5, one engine lathe, $2415; class 18, one portable hydraulic crank pin and small wheel press, $470.

Frevert Machinery Company, New York, class 6, one engine lathe, $1393; class 15, one duplex emery grinder, $249.

Long & Allstatter Company, Hamilton, Ohio, class 7, one double punch and shear, $1275.

Fairbanks Company, New York, class 9, one sliding head drill press, $210.

Manning, Maxwell & Moore, New York, class 10, one pipe threading and cutting machine, $1073.

Prentiss Tool & Supply Company, New York, class 11, one single head bolt cutter, $663.

W. R. Colcord Machinery Company, St. Louis, Mo., class 13, one drill grinder, $120.

Sherman-Brown-Clements Company, New York, class 14, one valve reseating machine, $175.

The Pacific Iron Works, Bridgeport, Conn., which was established in 1853, was reorganized some time ago with the following officers: President, William E. Burnham, formerly of the Eaton, Cole & Burnham Company; vice president, Henry A. Bishop, formerly purchasing agent of the New York, New Haven & Hartford R. R.; secretary and treasurer, A. J. Porter; general superintendent, George M. Chase. New equipment has recently been installed in the foundry and machine shops, affording up-to-date facilities for heavy and medium iron castings up to 10 tons in weight for the building of special machinery to order. The works is now turning out, among other products, automobile engines and propeller wheels.

The Halcomb Steel Company, Syracuse, N. Y., at a meeting held July 23, increased its Board of Directors from five to seven members and elected the following: Frederick R. Hazard, Fred. W. Scott, Frank E. Wade, C. Herbert Halcomb, Horace S. Wilkinson, H. P. Dennison and Lyman C. Smith. At the next meeting of the Board of Directors to be held for the election of officers, Dr. John A. Matthews will be elected to the board. Dr. Matthews recently took a position with the Halcomb Steel Company, having been with the Crucible Steel Company of America for some time at its Syracuse plant.

Trade Publications.

Gas Engines.—Buckeye Engine Company, Salem, Ohio. Catalogue. Devoted to the Buckeye four-cycle gas engine. The principle of the four-stroke cycle—admission, compression, explosion and expansion, and exhaust—is explained in connection with a diagram. The company's standard four-cycle double acting and single acting tandem engines are illustrated with exterior views and sectional drawings. The book also contains arguments favoring the use of gas engines for power.

Railroad Equipment.—Arthur Koppel Company, Machesney Building, Pittsburgh, Pa. Booklet. Shows Koppel cars and locomotives in operation on outdoor construction work, such as railroad building, concrete work, excavating work, &c. Particular attention is called to the Koppel double side dump cars, which can be dumped on either side.

Automobiles and Clutches.—Sturtevant Mill Company, Boston, Mass. Two catalogues. One illustrates the Automatic automobiles made by this company and the other the Sturtevant clutch, particularly adapted for use in automobiles. The construction and principle of action of the clutch are described at some length and its advantages pointed out.

Direct Current Generators and Switchboard Panels.—Crocker-Wheeler Company, Ampere, N. J. Bulletins. No. 104, superseding No. 82, deals with direct current railroad generators, and illustrates a number of important installations. Nos. 96 and 102 treat of alternating current switchboard panels. No. 101, superseding No. 68, is devoted to small generators, and No. 103 contains a reprint from the *Electrical Review* of the hydro-electrical power plant for the Chicago Drainage Canal, showing a 4000-kw. generator and other Crocker-Wheeler equipment in this plant.

Gasoline Engines.—Charter Gas Engine Company, Sterling, Ill. Illustrated hanger. Describes the various types and patterns of gasoline engines made by the company for operating mills, grain elevators, dynamos, boats, &c.; contains also a diagram showing a typical installation with circulating water tank for use where other water supply is not available.

Universal Tool and Cutter Grinders.—Norton Grinding Company, Worcester, Mass. Catalogue, 6 x 9 in., 61 pages. Chiefly devoted to tool and cutter grinders, which are made in two sizes; machine No. 1, with 15 in. between centers and having an 8-in. swing, and machine No. 2 taking 33 in. between centers and having a 10-in. swing. No. 1 can be furnished to operate with a swing of 10 in., and No. 2 can be made with a 12-in. swing. Considerable space is devoted to showing parts of the machines and the various wheels furnished with them. Some interesting illustrations showing the range of work that can be turned out by the equipment are given, and methods of operating the machines to turn out this work are illustrated by drawings. Directions for setting up are included. This volume should be particularly interesting to parties operating the machine.

Drills and Grinders.—United States Electrical Tool Company, Cincinnati, Ohio. Catalogue. Shows the company's complete line of portable electric hand drills, bench drills, radial drills, portable electric grinders which are used in connection with machine tools, surface grinders and bench grinders. Some of the many ways in which electric tools can be used for saving time and labor are illustrated.

Emery Wheels and Grinding Machinery.—Safety Emery Wheel Company, Springfield, Ohio. Catalogue No. 6, 6 x 9 in., 185 pages. This is a particularly complete catalogue of the company's line of grinding machinery and is copiously illustrated. Among the machines shown are bench grinders, floor grinders, surface grinders, polishing machinery, &c. Various grinding attachments are illustrated and emery wheels and other grinding attachments are shown. A number of machines arranged for motor drive are illustrated. The book contains a general description of all the machines shown, with prices and other information.

Gasoline Engines.—Waterloo Gasoline Engine Company, Waterloo, Iowa. Catalogue No. 10, 7½ x 9¼ in., 32 pages. The company's line includes water cooled, vapor cooled and open jacket or frostproof engines in stationary and portable form suitable for running on gasoline, gas, naphtha, kerosene, distillate and alcohol. These engines are all horizontal and operate on the four-cycle principle. The standard sizes go up to 10 hp. Illustrations are given of the applications of the engine for pumping, churning, cream separating, hay baling, &c., and a number of portable engines mounted on trucks are shown.

Pressure and Vacuum Gauges.—Standard Gauge Mfg. Company, Syracuse, N. Y. Bulletin No. 2. Devoted to the company's line of pressure and vacuum gauges, gauge boards and clocks. Several models are illustrated and prices and directions for ordering are included.

Beam Shears, Coping Machines and Bar and Angle Cutters.—International Electric & Engineering Company, 148 Chambers street, New York. Catalogue. This book is principally devoted to the S. & N. heavy duty beam shear, which can be made in all the known sizes. A machine with a capacity for 12 to 24 in. 100-lb. beams is shown, together with a series of views illustrating the operations of the knife. Other shears are illustrated, including machines of open-throat type, angle shears, coping machines and angle cutters.

Hand Bending Tools.—Estep & Dolan, Sandwich, Ill. Booklet entitled "The Bending Book." Includes arguments for the use of machine benders in blacksmith and machine shops. I benders, angle benders, ring benders, hinge benders are shown, together with various shapes they produce.

Seamless Drawn Steel Specialties.—Janney, Steinmetz & Co., Philadelphia, Pa. Booklet. Shows types of the company's seamless steel products, including seamless steel tanks, boilers, shells, reservoirs, air pumps and air pump fittings, radiators, barrels, &c.

Woodworking Machinery.—Crescent Machine Company, Leetonia, Ohio. Catalogue, 6 x 9 in., 64 pages. Contains numerous illustrations of woodworking machines, many of which are arranged for motor drive. The illustrations include new double spindle shapers and new types of 18-in. and 24-in. planers. Freight rates from the company's plant to various points throughout the country are listed, and the volume is comprehensively indexed.

Mine Cages.—Jeffrey Mfg. Company, Columbus, Ohio. Bulletin No. 24. Shows the Jeffrey drop rail mine cage, which is arranged in two parts, consisting of a hoisting section which travels in guide ways and maintains a fixed position, and a tilting section which carries the car and rotator or tilts forward when it is desired to empty the car.

Power Transmission Equipment.—T. B. Wood's Sons Company, Chambersburg, Pa. Catalogue, 6 x 9 in., 61 pages. Price-lists and illustrations of belt appliances, bushings, couplings, friction clutches, hangers, pulleys and other transmission fittings are included, together with directions for ordering.

Dynamo Brushes.—Cutler Hammer Mfg. Company, Milwaukee, Wis. Booklet. Deals with the Wirt dynamo brushes, which are designed for use with low tension direct current motors and generators, alternating current generators, plating dynamos and exciters. The construction of the brush is described and the pamphlet contains useful information on the care of commutators and brushes.

Antifriction Metals.—A. Allan & Son, 486 Greenwich street, New York. Bulletin I. This is the first of a series of bulletins intended to form an exhaustive descriptive catalogue of the Allan metal. The advantages of this composition as an antifriction metal are recited, together with methods of testing such metals. A history of the formation of the company is given, and comparisons are made with other Babbitt metals.

Fireproofing Material.—General Fireproofing Company, Youngstown, Ohio. Catalogue of dwelling houses constructed on what the book calls the "herringbone idea," including the adaptability of the Cementine construction in connection with the company's line of fireproof construction material, such as herringbone expanded steel.

Electrical Equipment.—General Electric Company, Schenectady, N. Y. Bulletins. No. 4586 illustrates and describes the G-I flame arc lamp; No. 4588, the G E-202 railroad motor, which is provided with commutating poles; No. 4590, starting devices for alternating current motors; No. 4594, Tungsten Economy diffusers, and No. 4595, aluminum lightning arresters for alternating current circuits.

Railroad Converter Substations.—General Electric Company, Schenectady, N. Y. Bulletin No. 4593. Gives a general description of the various pieces of substation apparatus, including rotary converters, transformers, blowers, cables, switchboards, &c., and includes illustrations of converter stations operated by various railroad companies.

Foundry Equipment.—Whiting Foundry Equipment Company, Harvey, Ill. Catalogue No. 51, superseding No. 40. Shows several types of air hoists adaptable for foundry use, together with air jacks, air receivers, hose trolleys, and compressed air jacket jib cranes.

Molding Machines.—Henry E. Pridmore, Chicago, Ill. Catalogue No. 6. Shows the various types of Pridmore molding machines, designed for molding stove plate in numerous shapes. Samples of work done by these machines are illustrated and prices and directions for ordering are included.

Gasoline-Gas Engines.—Fuller & Johnson Mfg. Company, Madison, Wis. Engine catalogue No. 6, 6¾ x 9 in., 40 pages. These machines are made in the vertical open jacket type up to 2½ hp., and in the horizontal type up to 16 hp. Machines are shown in use on farms, in sawmills and small manufactories, and several types are illustrated with views and sectional drawings. A chapter on the "A, B, C of Mechanical Horsepower" explains the amount of horsepower required to operate pumps of certain capacity and for hoisting purposes, &c. Directions for the proper adjustment and successful operation of the engines are included.

Pulverizers.—Jeffrey Mfg. Company, Columbus, Ohio. Catalogue No. 31-A, 6 x 9 in., 79 pages. Pulverizing and crushing machinery for coal, stone, cement and other products is illustrated in this volume, together with numerous types of roll crushers. A sectional view of the Jeffrey standard roll crusher is shown, and space is given to centrifugal fans, electric hoists, rotary drills, bucket elevators and electric locomotives.

OBITUARY.

SHEPARD P. BROWN, once prominent in the iron trade, died July 23 at Plattsburg, N. Y., aged 84 years.

JOHN H. PIERCE, for many years president of the Western Tube Company, Kewanee, Ill., died July 22, after an operation at Mercy Hospital, Chicago, aged 65 years.

EDWARD S. BARTLETT, president of the Webert Gas Engine Company, Rochester, N. Y., was drowned July 25 while automobiling.

E. C. WHEELER, superintendent of Stanley G. Flagg & Co.'s foundry at Pottstown, Pa., died July 26 at Wildwood, N. J.

WILLIAM S. THATCHER, general manager of the iron works of R. D. Wood & Co., at Florence, N. J., died July 24 at Seaside Park, N. J. He had been in charge of the works for 34 years, and was also president of the Florence Thread Company.

WARREN L. FISH, who, it is claimed, invented the first oil stove, and had distinguished himself by the invention of numerous other devices, died July 24 at Newark, N. J., aged 83 years.

JOHN WILKES, manager of the Mecklenburg Iron Works, Charlotte, N. C., died July 6, aged 81 years. Captain Wilkes was graduated from the United States Naval Academy in 1847, and served in the navy until 1854. He was for some years engaged in gold mining and flour milling in North Carolina. In 1861, in connection with his brother Edmund, he built a railroad for the Confederate Government between Greensboro, N. C., and Danville, Va. In 1865 he organized the First National Bank of Charlotte, which was the first national bank established south of the Potomac River, and was its president from 1865 to 1869. For the past 40 years he has been the manager of the Mecklenburg Iron Works, which he developed from a wayside repair shop to a high-class foundry and machine works. He leaves a widow, two sons and two daughters.

CHARLES LEVI LINCOLN, Hartford, Conn., long identified with the business known as the Lincoln Foundry, died July 22, aged 83 years. He was born in Dorchester, Mass., his father being Levi Lincoln, who in 1834 established the iron foundry on Arch street, Hartford, now included in the plant of the Taylor & Fenn Company. Levi Lincoln associated with him in the business his two sons, George S. and Charles L., the latter being admitted to the firm in 1846. Afterward the business was conducted as George S. Lincoln & Co., and upon the retirement of George S. in 1885 it was continued by Charles L. Lincoln and his sons, Charles P. and Theodore M., first as Lincoln & Co., and afterward as the Lincoln Company, of which deceased was the president. The business was sold to the Phœnix Iron Works Corporation some years ago, and recently was combined with that of the Fenn Machine Company as the Taylor & Fenn Company. Mr. Lincoln was a director of the Hartford & Wethersfield Horse Railway Company until it was taken over by the New York, New Haven & Hartford Railroad, and was a trustee of the Mechanics' Savings Bank. He leaves a widow, two sons and three daughters.

FRED HERBERT SMITH, president, treasurer and one of the founders of the F. H. Smith Mfg. Company, Chicago, maker of hardware specialties and screw machine products, died July 14.

CYRUS W. MERRELL, who had been engaged in the ore business for 26 years as an associate of Oglebay, Norton & Co., Cleveland, Ohio, died July 22 of pneumonia. He was secretary of the Commonwealth Iron Company, the Montreal Mining Company, the Bristol Mining Company and the Castile Mining Company.

Plans of the Manufacturers' Club and members of the Cincinnati Metal Trades Association for an excursion for business purposes to South American centers are maturing, and it is expected that a manager of the tour will have been appointed and active work commenced by September 1. The ship which is to be chartered will be engaged for 100 days, and about 60 manufacturers will make the trip. President E. H. Hargrave of the Cincinnati Tool Company has the matter in charge.

United States Steel Corporation's Earnings.

The statement of the United States Steel Corporation's earnings for the quarter ending June 30, 1908, makes the following showing, as compared with the corresponding period of 1907:

	1907.	1908.
April	$14,600,838	$6,761,680
May	16,056,832	6,021,279
June	14,846,035	7,482,797
Total after deducting all expenses incident to operations, including those for ordinary repairs and maintenance of plants and interest on bonds and fixed charges of the subsidiary companies	$45,503,705	$20,265,756
Less appropriations for sinking funds on bonds of subsidiary companies, depreciation and reserve funds	7,723,230	3,911,766
Net earnings	$37,780,475	$16,353,990
Deduct interest for the quarter on U. S. Steel Corporation bonds and sinking funds for quarter on corporation bonds.	6,936,963	7,311,963
Balance	$30,843,512	$9,042,027
Dividends for the quarter:		
Preferred, 1¾ per cent. $6,304,919		
Common, ½ per cent. 2,541,513	8,846,432	8,846,432
Surplus for the quarter	$21,997,080	$195,595
Less appropriated from surplus on account of expenditures made and to be made on authorized appropriations for additional property, new plants, construction and discharge of capital obligations	18,500,000	.....
Balance of surplus for the quarter	$3,497,080	$195,595

For the first quarter in 1908 the earnings were $18,229,005, and the surplus was $7865.

The unfilled orders on hand June 30, 1908, were 3,313,876 tons, against 3,765,343 tons at the close of the previous quarter.

The Spencer Wire Company Buys the Taunton Steel Company.—The Spencer Wire Company, Worcester, Mass., has secured control of the Taunton Steel Company, Taunton, Mass., manufacturer of high speed steel drill rods, and the business has been removed to Worcester. It will be operated for the present under the name of the Taunton Steel Company Division of the Spencer Wire Company. Enlarged and improved facilities have been provided for developing the drawing of the steel under the special process of H. A. Williams, who has associated himself with the Spencer Wire Company in the conduct of the department. Under this process the steel is drawn without any annealing whatever, and is produced uniform in gauge and roundness, it is claimed, even more exactly to size than common carbon steel by the regular processes employed in mills. The same process can be applied to other metals that are difficult or impossible to draw by the regular methods, such as German silver, leaded brass and bronze, tin, zinc, and gold.

The Shelby Tube Company Incorporated.—Backed by many of the leading citizens of that place, who are planning the erection of a tube mill in Shelby, Ohio, to take the place of the mill of the United States Steel Corporation that was recently destroyed by fire, the Shelby Tube Company has been incorporated, with a capitalization of $500,000. It is claimed that $250,000 in stock has been sold and that ground will be broken soon for a new plant. The company has elected the following officers: J. C. Fish, president; G. M. Skiles, vice-president; C. S. Hook, second vice-president; A. C. Moore, general manager; Howard Seltzer, secretary, and James Brubaker, treasuer.

A special meeting of the stockholders of the Colonial Steel Company, Pittsburgh, will be held September 28, to vote on a proposition to increase the capital of the company from $1,500,000 to $2,000,000. The new issue of shares is to be 7 per cent. cumulative, and preferred as to dividends and assets. The increased capital is to be used for expansion of the business. The Board of Directors is to be increased from five to seven.

HARDWARE

THE problems of business in these days when things are moving so rapidly and new elements are constantly entering the commercial and industrial field are an interesting study to those who in a broad way endeavor to keep in close touch with the trend of things. The complexity of the problem is increased by the manner in which all parts of the world are brought together in the news of the day and in the constantly widening relations of international trade. In this way influences at first of a local character are soon felt in a wider field and make their impress on business conditions in far distant lands. It is therefore necessary for the merchant who would take a comprehensive view to look far beyond his immediate surroundings and consider tendencies and influences which sooner or later will operate in the comparatively limited field with which he has to do. All this tends to make business, as one of our great merchants remarked, interesting and even fascinating.

Whether or not the judgment formed in regard to the course of things or any impending change is entirely correct, there is no doubt that the man is of broader gauge for having formed it, and if he continues his attitude of observation and alertness he will be in a much more advantageous position in regard to later developments than his unobservant competitor who takes little interest in the movement of trade beyond the boundaries of his own community. It would, however, be a mistake to make the chief attractiveness of business reside in contemplation or abstract consideration of things remote from the merchant's immediate interests. In connection with this breadth of outlook and information concerning things at a distance there is not only a call for constant study of things near at hand, but also a need of practical wisdom in regard to the course to be pursued and the things to be done, coupled with the energetic putting forth of efforts to use existing opportunities to the best advantage. There is thus a happy combination of the theoretical and the practical. When business is transacted along these lines there is the development of a high type of merchant. Whatever truth there may have been in the designation of the English as a nation of shopkeepers, the taunt will have little force when business men in any fair degree measure up to this high standard.

Condition of Trade.

Indications of a better feeling with a somewhat increased volume of business characterize the closing days of the month. The gradual improvement in the underlying conditions of the market is becoming more generally recognized. The financial stress being practically over and money abundant people are looking about for channels in which it can be safely employed, and there is thus a beginning of enterprise along conservative lines. This is shown in building in which, with the substantially diminished cost of materials, and in some cases of labor, there is a fair activity throughout the country, especially in the erection of buildings of small size. Business with the railroads shows a little increase, but this line is far from active, and the market thus lacks the support which would come from liberal buying in these heavy products. Prices of Hardware and allied goods are pretty steady, the changes of the week being, for the most part, unimportant, and in the line of revision, with a little scaling down here and there. It remains to be seen to what extent liberal orders would secure concessions from regular quotations which hold fairly steady on ordinary moderate lots. The crop reports continue to contribute to the hopefulness which is beginning to pervade the trade, as a large harvest is becoming more and more assured. A good many manufacturers are giving increased attention to foreign markets, recognizing as they do the importance of finding an outlet for the products which are not fully taken by the trade at home. Taken all in all, the month draws to a close with conditions which should be satisfactory, evidencing as they undoubtedly do a real improvement in the situation and a reasonably healthful movement of trade. Satisfaction may be taken in the thought that while the volume of the month's business is not as large as a year ago, the indications point to a gradual and perhaps marked improvement during the remainder of the year, instead of the rude disturbance which overtook the trade last October. Regarded in this light, there is no doubt that things are in better shape now than they were last July, notwithstanding the general activity and the pressure under which business was then carried on.

Chicago.

One by one the doubts that have clouded the commercial and industrial skies are being resolved and in corresponding ratio the fabric of public confidence upon which in the last analysis hangs the whole issue is being slowly but surely restored. As the harvests proceed the question of crop yields are being determined, and, so far, they have been quite satisfactory in nearly all sections with excellent prospects ahead for a high average throughout the country. While there are yet some other problems awaiting solution and an intervening period of political uncertainty between now and the November elections, it is significant that market transactions are gradually growing in volume. In this between-season time commercial energy is always more or less relaxed, and if trade has vitality enough to not only maintain headway, but to even show some acceleration in face of natural drawbacks it augurs well for a reasonable degree of activity when the fall demand sets in. Since the moderate improvement which seems to be characteristic of the market as a whole is not uniformly manifested in all industries alike, it naturally follows that the distribution of benefits through the various Hardware lines is likewise by no means uniform. Manufacturers of goods consumed largely by the railroads are still confronted by a restricted demand, due to the extreme retrenchment policies of these interests. Some increase in car repair work has necessitated larger purchases of some material, such as Bolts, Nuts, Roofing Sheets, Nails, &c., but this work has not yet assumed such proportions as make it widely felt as a market factor. Price conditions are in the main unchanged, the only alteration of noteworthy importance being a revision of the list prices of Telephone Wire by the American Steel & Wire Company. Effective July 20, the list prices on Extra BB, BB and Steel are reduced ½ cent from the list issued May 1, 1908.

NOTES ON PRICES

Wire Nails.—Business with the mills shows somewhat of an increase, but is confined to near-by requirements. Orders are for small lots for early shipment, indicating that jobbers are not carrying large stocks. The character of the demand is regarded as reflecting a good

condition of things in the trade, with a prospect of at least a fair fall business. Quotations for base sizes are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$1.95
Carload lots to retail merchants	2.00
Less than carloads to jobbers	2.00
Less than carloads to retail merchants	2.10

New York.—Business is moderate in volume and not much of an increase is anticipated in the coming two or three weeks. Prices are regarded as being fairly well maintained in the metropolitan district, but in near-by territory some unevenness is reported, especially in less than carloads from mill. Nails are held on the basis of $2.30 per keg in small lots at store.

Chicago.—The trade for July has thus far run close to last year's volume for the same period. It has been and still is composed of prompt orders for immediate shipment. It is believed that there has been no accumulation of stocks by either jobbers or retailers. Prices are reported to be uniform and firm. Quotations are as follows: $2.13, in car lots to jobbers, and $2.18 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—Local mills report a somewhat better demand for Wire Nails, but indicate that new business being placed is still confined to small lots for actual needs, the large trade not being disposed to anticipate their requirements. However, the feeling is getting stronger that present prices of Wire Nails will be maintained, and if this continues it will likely lead to a heavier demand in the near future. Quotations for base sizes are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$1.95
Carload lots to retail merchants	2.00

Galvanized Nails are quoted at $1 over the price of the regular Nails.

Cut Nails.—The market indicates the same quiet tendency which has characterized it for some time. Demand is confined to actual requirements, and is usually for small lots. Quotations on Steel Nails are on the basis of $1.80 per keg, at mill, $1.75 being obtainable on the most desirable business. In the Western market Iron Cut Nails are held at an advance of 10 cents per keg over Steel Cut Nails, but this differential is not observed in the East.

New York.—The local market is quiet and business is of moderate proportions. Steel Cut Nails are held on the basis of $2.15 per keg, for small lots at store.

Chicago.—The demand for Cut Nails has been perceptibly increased, and is closely limited to scattering small orders for current consumption. Price conditions are unchanged, the majority of the business going at regular quotations, although concessions of 5 cents a keg are still possible on specially desirable orders. We quote Chicago prices as follows: In car lots to jobbers, Iron Cut Nails, $2.08; Steel Cut Nails, $1.98. In small lots from store: Iron Cut Nails, $2.25; Steel Cut Nails, $2.15.

Pittsburgh.—Demand is only fair, and is altogether for small lots for actual needs. We quote Steel Cut Nails at $1.75 to $1.80 at mill, the lower price being available only in carloads and larger lots. Small lots from store are held at $1.90 to $2, and Iron Cut Nails are 10 cents per keg above these prices.

Barb Wire.—Shipments are being made on specifications from contract orders, but new business is light, as is usually the case at this season. Quotations are as follows, f.o.b. Pittsburgh, 60 days, 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.10	$2.40
Retailers, carload lots	2.15	2.45
Retailers, less than carload lots	2.25	2.55

Chicago.—Trade as is usual at this season of the year is very quiet, with only desultory orders being placed. Prices continue firm and unchanged. Quotations are as follows: Jobbers, Chicago, car lots, Painted, $2.28; Galvanized, $2.58; to retailers, car lots, Painted, $2.33; Galvanized, $2.63; retailers, less than car lots, Painted, $2.45; Galvanized, $2.75; Staples, bright, in car lots, $2.25; Galvanized, $2.55; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—This is the dull season in the Barb Wire trade and the present is no exception. There is practically no new demand, but some tonnage is being shipped out by the mills against contracts. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.10	$2.40
Retailers, carload lots	2.15	2.45
Retailers, less than carload lots	2.25	2.55

Plain Wire.—Manufacturers are not anticipating fall requirements to any extent, but are ordering in moderate quantities. Quotations per 100 lb. to jobbers in carload lots are as follows, on a basis of $1.80 for Plain and $2.10 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the price to retailers being 5 cents additional:

Nos.	6 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.80	1.85	1.90	1.95	2.05	2.15	2.25	2.35
Galvanized	2.10	2.15	2.20	2.25	2.35	2.45	2.85	2.95

Chicago.—Manufacturers, though not extending their orders to include future requirements, are, notwithstanding, ordering more liberally, and fence makers are making up moderate stocks in anticipation of a fairly good fall fence trade. Prices and price conditions remain unchanged. We quote as follows: Car lots to jobbers, $1.98, f.o.b. Chicago, and to retailers, $2.05.

Pittsburgh.—While present demand is only moderate, the mills look for a large business in the fall. Present orders are mostly in small lots, buyers taking care only of actual requirements, and there is no disposition on the part of the large trade to buy ahead. We are advised that prices are being absolutely maintained. Quotations per 100 lb. to jobbers in carload lots are as follows, on a basis of $1.80 for Plain and $2.10 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the price to retailers being 5 cents additional:

Nos.	6 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.80	1.85	1.90	1.95	2.05	2.15	2.25	2.35
Galvanized	2.10	2.15	2.20	2.25	2.35	2.45	2.85	2.95

Wire Belt Hooks.—Quotations on Wire Belt Hooks have for some time shown a declining tendency. A recent reduction by some manufacturers makes the ruling discount to retail trade on Nos. 1 to 15, from 75 and 10 to 80 per cent.

Telephone Wire.—The market for Telephone Wire has under the stress of some active competition shown some irregularities and concessions have been made in price. The American Steel & Wire Company, under date of July 20, issue revised prices of their W. & M. Telephone Wire as follows, there being in less than 1500-lb. lots ¼ cent per pound advance:

W. & M. Telephone Wire.

Diameter in decimals of an inch.	Sizes Birmingham wire gauge.	List prices in cents per pound. Extra B. B.	B. B.	Steel.
0.203	6	4⅜	3¼	3
0.165	8	4⅜	3¼	3
0.148	9	4⅜	3¼	3
0.134	10	4½	3⅜	3⅛
0.120	11	4½	3⅜	3⅛
0.109	12	4⅝	3½	3¼
0.083	14	5⅛	4	3¾

The circular announcing these revised prices contains interesting matter in regard to the Wire, number of bundles per mile, weights per 1000 ft. and per mile, list prices of Steel Wire Strand and other information relating to Telephone Wire.

Lawn Mowers.—The early part of August usually marks the opening of the Lawn Mower market, manufacturers at that time beginning to solicit contracts from the larger trade for next year's business. As stated some weeks ago in these columns, the opinion generally prevails that prices are unlikely to show much variation from last season.

Sash Cord.—The Sash Cord market seems to be in good condition, and a very fair volume of business is reported. Prices are still low, but do not show irregular-

ity, and manufacturers express the belief that any movement this fall is likely to be toward a higher rather than a lower level.

Rope.—Improvement is noticed, from week to week, in demand for Rope, but increase in the number or size of orders is exceedingly slow. Manufacturers are, and have been, controlling their output in proportion to the requirements of the trade. Pure Sisal Rope is stiffer, but Mixed Sisal is more often ordered. Quotations are as follows: Pure Manila, 9½ to 10 cents; Pure Sisal, 7 to 7½ cents: No. 1 Jute, ¾-in. and up, 5¾ cents; No. 2 Jute, ¼-in. and up, 5¼ cents.

Window Glass.—At a meeting held on the 28th inst. by the Eastern Jobbers' Window Glass Association the price for Greater New York was advanced as follows: Single, 90 and 25 per cent. discount; Double Strength Glass, 90 and 30 per cent. discount. Stocks in manufacturers' hands are becoming broken in assortment, espeially A quality. The output of hand blown factories is becoming curtailed by the closing of additional plants, and according to reports but four or five plants remain in operation. Manufacturers, it is understood, are not making general prices, but are only quoting on specifications, and it is expected that factory prices will be advanced in August. The market has taken on a more firm tone than has characterized it for some time.

Linseed Oil.—Local business is light, and as a rule is confined to immediate requirements. A few carloads have been sold on the basis of 41 cents for Raw, for delivery during August and September, but crushers appear to be unwilling to contract further ahead, even if buyers wished to. Prices have been maintained, despite lack of active demand, which indicates a really strong Oil market. Quotations in barrel lots are as follows: State and Western Raw, 42 to 44 cents; City Raw, 44 to 45 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—A feature of the Southern market has been for some time the ability of operators to prevent prices dropping below 40 cents. The price on the 21st inst. reached 42½ cents, which resulted in receipts of Turpentine which were too large to be absorbed by the trade, so that the price went below the 40-cent mark. The lower price is attracting large interests and export buyers, but in the New York market demand is light, and is represented by the following quotations: Oil Barrels, 40 to 40½ cents; Machine Made Barrels, 40½ to 42 cents per gallon.

Trade Relations with Australia.

A PROMINENT New England manufacturer has favored us with copy of a letter received from his Australian representative, in which the latter expresses regret that the Australian Government has reinstated the duty of 12 cents per pound on catalogues and other printed matter. He also comments on one of the articles on Australian trade which have appeared in our columns, making the following remarks on the subject of shipping facilities, in which it will be observed that he expresses great disappointment that the last Congress failed to pass the subsidy bill, which was intended to provide a regular mail service between San Francisco and Australia, and urges that the trade organizations of this country should take this matter up aggressively and prevail upon the national legislature to do something to relieve the situation:

Without a doubt, this deplorable state of affairs exists owing to the unsatisfactory nature of the mail service communication upon which we have at present to depend. I will try to illustrate the position: The United Tyser Line dispatched the Star of New Zealand from New York on April 19, and after calling and discharging cargo at Melbourne the vessel arrived in Sydney on June 4, representing 54 days' voyage. The documents covering that shipment would be mailed, say, four days after the dispatch of steamer, and therefore would certainly miss the Vancouver mail, which left there on April 25, so that a delay of one month would occur, and the consequent detention of these important documents.

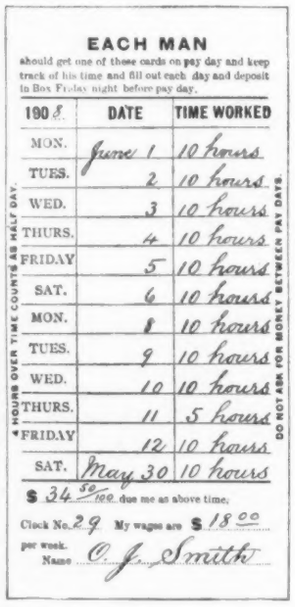
You can readily perceive the situation, and will understand me when I express disgust that your House of Representatives the other day rejected the Subsidy bill, which was designed to provide a regular and efficient mail service from San Francisco to Australia.

I had hoped that this legislation would be passed, and that a satisfactory and regular mail service would be established between your country and this. The present conditions are most exasperating, as it frequently happens that goods shipped from New York by cargo steamer reached port of destination before the documents are to hand, and this is not only irritating, but is a source of additional expense.

What I would like you and my other principals to do is to stir up your trade organizations, so that the commercial interests of your country may put the necessity for efficient mail communications in the proper light before your legislators and compel them to adopt a reasonable and business-like attitude. You do not ask them to carry your goods for nothing, but simply demand that they shall provide the bare facilities for doing business, without which no country or people can progress. I regard this as a very important matter, and I hope that it is one that will engage your attention.

Factory Time Card.

THE accompanying illustration represents a time card in use by W. C. Heller & Co., Montpelier, Ohio, manufacturers of steel Hardware Shelf Boxes, Seed Cases, Screw and Bolt Cases, &c. The cards are 3½ x 6¼ in. in size, and are printed on heavy blue card board, this color best withstanding the effects of dirt from constant handling by the men. The cards are used in connection with a record clock as a double check on the payroll department, and were adopted because a workman is apt to make a mistake and ring another man's time, especially when late and in a hurry in the morning. Notwithstanding the great care taken to avoid errors, there were differences in some of the men's money on pay day, which took time to explain and straighten out. Wages are paid every second Saturday, as the company's week closes on Friday night; therefore, the cards are retained by the men two weeks. Each man keeps his own time on his card and deposits it in a box in the office the Friday night before pay day. This gives the company time to check up the cards with the sheet from the time clock, and if there are any differences the men are called to the office and the matter is straightened out. The amount required for the payroll can then be drawn from the bank, with the assurance that it will be correct. The men each receive a new card when they draw their pay on pay day. Four hours' overtime counts as half a day, and men are requested not to ask for money between days. The first entry on the card illustrated is on Saturday, May 30, and according to the record O. J. Smith has kept, $34.50 is due him as above time. His wages are $18 per week, and his number on the clock is 29. Thus all the information required is condensed in a small space at the bottom of the card. Should a man commence working on any other day besides Saturday, it would make no difference with this system, as the days he worked during the two weeks would appear in consecutive order.



EACH MAN

should get one of these cards on pay day and keep track of his time and fill out each day and deposit in Box Friday night before pay day.

190 8	DATE	TIME WORKED
MON.	June 1	10 hours
TUES.	2	10 hours
WED.	3	10 hours
THURS.	4	10 hours
FRIDAY	5	10 hours
SAT.	6	10 hours
MON.	8	10 hours
TUES.	9	10 hours
WED.	10	10 hours
THURS.	11	5 hours
FRIDAY	12	10 hours
SAT.	May 30	10 hours

4 HOURS OVER TIME COUNTS AS HALF DAY. DO NOT ASK FOR MONEY BETWEEN PAY DAYS.

$ 34 50/100 due me as above time.

Clock No. 29 My wages are $ 18 00 per week.

Name O. J. Smith

Factory Time Card Used by W. C. Heller & Co.

THE MIDSUMMER EDITION of the official gazette of the Iowa Retail Hardware Association, A. R. Sale, secretary, Mason City, has lately been issued. It refers to several topics of general interest and also contains a number of announcements as to local happenings. It is stated that new members can now obtain a certificate good until Feruary, 1910. Seven hundred members are reported on the rolls.

DEMONSTRATIONS OF SUMMER GOODS.

BY CLARFIELD.

A PRACTICAL demonstration of what an article will do is worth volumes of talk upon the subject. The Hardwareman will find many things in his stock that will virtually sell themselves if he will only devise means to show them in operation. Such features are doubly beneficial when, as they nearly always do, they attract attention to other lines of merchandise and help the general business of the store.

Various methods of showing Refrigerators in operation have been mentioned from time to time. Perhaps the most common of these is to employ a Refrigerator with double glass instead of wood panels in the doors, or, better still, to have one with the entire back of glass. The latter style will show not only the contents of the food chambers, but also the various walls of the sides, clearly demonstrating the felt or cork interlining and the character of workmanship. Some merchants have placed a box of matches in the food chamber, and have taken them out singly to light for customers, thus proving that the air is not only cold but absolutely dry. Others have used a large thermometer, which could be easily read from the outside, and would forcibly impress the degree of cold. Another plan is to place milk, fruit and vegetables in the same chamber to prove that the air is dry and that milk and butter cannot become tainted. An enterprising Refrigerator manufacturer exhibits in his window a Refrigerator, in which he has placed a window ventilator of the pinwheel type, which is kept constantly revolving by the circulation of air.

Showing Up Refrigerators.

An effective and unique demonstration of Lawn Mowers was recently given by a Pennsylvania merchant who advertised that on a certain afternoon the public park lawns would be entirely mowed with Lawn Mowers of different models which he had for sale. He engaged 10 men in whom he could place reliance, and placed them in an oblique line, so that each would overlap the path of the next ahead, the principle being the same as that employed by the reapers in the great Western wheat fields. The event attracted a great deal of attention and comment, the work was done in a remarkably short period of time, and, as Mowers of various grades and prices were shown, with clerks upon the field to explain them, a number of sales were made. These direct sales, however, were probably not of as much bnefit to the store as the general advertising obtained.

Lawn Mowers in Practical Use.

Nearly every Hardware merchant has one or two Ice Cream Freezers which he especially recommends because of their various points of merit. Nothing will so well impress these points as "special ice cream days," at which times the cream can be made before the ladies who attend the demonstration, and served to them as an example of the work that the Freezer will do. Such a demonstration need not be very expensive. Of course, it is necessary to retain some one to make the cream who understands both the Freezer and the art of cream making thoroughly.

Ice Cream Days for the Ladies.

Cherry Pitters and Apple Parers can be demonstrated almost constantly in the store without much trouble. In conjunction with other demonstrations they always prove attractive. Many such articles are sold simply because the customer has seen them in operation when she may have come to the store for something else.

Cherry Pitters, Apple Parers.

Advertising will help such events just as it will help the general sales. In fact, when they are well advertized they become much stronger and more valuable than when they are not. Such plans should be employed by every enterprising Hardware merchant. Their value to a business is far greater than the time, trouble and outlay involved.

Advertise the Demonstrations.

INTERCHANGE OF DELEGATES A FORWARD MOVE IN STATE HARDWARE ASSOCIATION WORK.

To the Editor: Under date of July 23, *The Iron Age* editorially notes the meeting of the Carolinas Association and the favorable action taken by it as to inviting delegates from other associations to its annual convention and the sending of its own delegates to various State meetings. The incident of having with them a New York member bearing greetings and good will was possibly responsible for a suggestion that if developed and carried into State association work throughout the country would undoubtedly be productive of added strength, added interest and great general good for the membership. It will also redound to the everlasting credit of the Carolinas Association if in its development the interchange is brought about, and but goes to show that in the forward march of this great work we cannot afford to be without the enrollment of an association in every State.

Another incident. The writer recalls with pleasure that in one of the later Ohio conventions there were present with us the president of the New York Association and the president of the West Virginia Association, dropping in on us informally perhaps, but so cordially welcomed in either case that no question exists as to the advisability and wisdom of sending and asking for delegates, and none as to the hearty greeting that would be offered and the prospective mutual benefits to be derived therefrom. You will recall, too, that at every convention—and this has been the case at all Ohio meetings—telegrams of greetings and congratulations have been sent to other associations convening or about to convene. How much better would it be, and to what greater purpose would the interchange of delegates with their newer ideas and their reports from other associations appeal to the membership of any association, with the bringing together of far away sections, customs and the *personnel* of the delegates themselves.

An Ohio Incident.

The benefits to be derived would be many and would develop at every association meeting. Largely they would come as the result of sending the best men in this class of work—men who can say something in "the hour for delegates" that might be appointed—men who develop and bring new thoughts with them, and association work has developed men of this class whose growth has been beyond belief. None of us get the best that is in a man except by personal contact, and the result would be that what we have not, they could give us; what we have, they would gladly take away with them. In every association there are men in the ranks who desire no official position, yet are workers and ideal men to cover just such ground as this, and whose contributions to other associations would evidence their brainy growth in their own.

Personal Contact.

Conditions are favorable, and they are more favorable now, perhaps, than at any time since organization work began. The spirit of fellowship and good feeling among merchants has grown until it is considered an actual asset. The desire to know and talk with men from other sections, to learn, to improve one's own methods, to grow, is almost universal among business men. The interchange of delegates would also create a bond and a tie as between associations that does not now exist, and cannot ever exist, in isolated work.

Would Create a Bond and Tie.

Some time to develop a situation of this kind would be necessary, for the reason that conditions vary greatly in various associations. With the sectional classifying of State association meetings as provided at the National Association meeting at St. Louis, all of the association work could not well be covered without an interference of dates by any one organization, and without losing the good to the delegate of his presence at his own meeting. This would properly develop, however, as the great work of the States has progressed and developed, with the earnest consideration of the delegate system as proposed, and the writer firmly believes its taking up

Development of the Idea.

would be a large feature in added membership and added interest in every existing State association.

The Matter of Expense.

As to the expense incurred in sending such delegates, the results to be obtained should certainly offset any and all expense incurred. While there may be many men in every association perfectly able and perfectly willing to go at their own expense, it would seem a legitimate one belonging to the association sending the delegate or delegation. This would develop along with many other matters in connection with and belonging properly to the individual associations.

Discussion by the Trade.

This article and these suggestions are offered only in the spirit of betterment for association work, and are based entirely on the action of the Carolinas Association and the later article on the subject by Mr. Williams, supplemented by the writer's firm belief in it as one of the very good methods offered leading up to our growth as associations—our increased interest, and therefrom our increased growth. The writer feels that the subject has in it so much of value attached to the work that it is worth more than a passing notice, and trusts that many members of associations will give voice to their opinions on the subject. H. C. W.

Trade Items.

H. M. HERMAN, Sydney, Australia, who has been in this country for about four months, making arrangements with manufacturers for representation in Australia, New Zealand and Tasmania, expects to depart for home the latter part of August. Among concerns in the Hardware line whose Australian interests will be looked after by Mr. Herman is the Smith & Hemenway Company, 108 and 110 Duane street, New York, where he may be addressed by any desirous of communicating with him.

ABOUT August 1, the Central Stamping Company will remove its offices and salesroom from 24 Cliff street to 172 and 174 Fulton street, New York, three doors west of Broadway.

THOS. F. BOWKER of the Iver Johnson's Arms & Cycle Works, Fitchburg, Mass., is sailing for Europe on the 30th inst. He will spend several weeks in travel on the Continent.

IN connection with other advertising helps furnished gratis the J. Stevens Arms & Tool Company, Chicopee Falls, Mass., is now ready to supply Hardware and Sporting Goods merchants making application for them half-tone electrotypes, which are designed for use in embellishing letter or bill heads, circulars and envelopes for correspondence. The electrotypes are of a pictorial character, and any one or the entire series of three will be forwarded by the company as desired.

Pacific Hardware & Steel Company.

THERE has recently been a change in the personnel and stock holdings of the Pacific Hardware & Steel Company, San Francisco, Cal. A. L. Scott and H. J. Morton of that city, and W. T. Smith of Elko, Nev., and Hiram C. Smith of San Francisco, have acquired the stock of the Sloss interests in the company, from which Joseph Sloss and J. C. Brittain have retired. The new officers are as follows: A. L. Scott, president; H. J. Morton, first vice-president, and W. T. Smith, secretary and treasurer.

A certificate of incorporation has been filed by the F. P. Pfleghar Hardware Specialty Company, New Haven, Conn.

Thompson Hardware Company has succeeded to the Hardware, Stove, Harness, Paint, Fencing, Sewing and Washing Machine business of Thompson & Son, Ness City, Kan.

Billings & Brosseau, Rutland, Vt., have dissolved partnership and have been succeeded by Billings & Davis, who will carry a general line of Paints, Trunks, Horse Furnishings, &c., at the old stand.

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A Niche in the Hall of Fame.

THE effective window display of Locks and other related goods here reproduced was arranged by the Murphy-Maclay Hardware Company, Great Falls, Mont., under the direction of H. W. Dieterle of that house. The motive of the display is the phrase, "A Niche in the Hall of Fame," appearing on the painted sign in the center of the window. The niche forming the background was 9 ft. long, 9 ft. high, 6 ft. deep, and was built entirely by the firm of lumber and sheet metal. It was painted white, as was the pedestal within the niche which supports the cylinder. Behind this was a background of white cloth. The trefoil trademarks were painted on the arch, and artificial green leaves were tacked around to give decorative effect. Gold was used to set off the embossed work at the top of the arch and on the moldings.

Within the niche, besides the cylinder resting on the pedestal, and the key which was suspended by fine Wire, were a Blount Door Check on a special stand, a No. 42 Night Latch and a Store Door Handle on the floor. A variety of goods, similar in character, were arranged in the foreground, which was covered with white cloth. The Lock cylinder was made by fastening a large embossed paper cylinder head furnished as an advertisement by the manufacturer, to a tin cylinder, which was gold bronzed to resemble solid bronze. The key way and the word Yale on the cylinder head were cut out and backed with white tissue paper. An electric light was then placed in the cylinder at the rear, which shone through, bringing out the details conspicuously.

Window Display of the Murphy-Maclay Hardware Company.

The pedestal was made of galvanized iron, and the trefoil trademark on it was punched out of the metal. The latter was lined on the back with white tissue paper, and was illuminated by a light within the pedestal in the same manner as the cylinder. Taken as a whole, the display was unusually elaborate and artistically worked out. It elicited much appreciative commendation both on the goods displayed and the originality, skill and taste shown in dressing the window.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM BEAUVAIS FRERES, Montreal, Que., who handle General, Household and Kitchen Hardware, Cutlery, Sporting Goods, Paints, &c.

FROM RUECHEL & MILLER, Loveland, Colo., who have succeeded Laudermilk & Ruechel in the Hardware and Implement business.

FROM SUMMER BROS. COMPANY, Newberry, S. C., who have added a line of Automobiles and would like to receive catalogues of sundries, &c.

FROM BALDWIN HARDWARE COMPANY, Bay Minette, Ala., which will open for business about September 15. The officers of the company are J. W. Adkisson, president; E. Luttrell, secretary and treasurer, and B. F. Luttrell, vice-president and manager. They were formerly members of the Luttrell Hardware Company, Brewton, Ala., which was a connection of the Florala Hardware Company, Florala, Ala.

FROM YEATES & WALLACE, Starkville, Miss., who have been succeeded in the Hardware, Store, Implement, Paint, Sporting Goods and Vehicle business by Zeno Yeates.

Denatured Alcohol.

HON. JOHN G. CAPERS, a former United States Commissioner of Internal Revenue, as special commissioner, and Dr. C. A. Crampton, chief chemist, Bureau of Internal Revenue, in charge of experiments relating to the uses of Denatured Alcohol, sailed for Europe July 21, on the Kaiser Wilhelm, II. They will visit as representatives of the United States Government the European distilleries producing Denatured Alcohol, especially plants in Germany, Austria, France and Belgium. The purpose is to study the methods in vogue abroad where this important staple has made much greater progress for years, through the remission of the government tax, than has been possible in the United States, notwithstanding that Congress exempted Denatured Alcohol from taxation a year or two since. It will be recalled that Congress has appropriated $20,000 with which to build a model distillery for the manufacture of Denatured Alcohol, which is now being erected.

THE BENJ. S. ALDER COMPANY, 37 Warren street, New York, which has recently taken the account of Griffin Mfg. Company, Erie, Pa., has issued a cleverly illustrated mailing card calling attention to the fact that it is carrying a complete stock of this manufacturer's line, including wrought Strap and T Hinges and Butts, Wrought Shelf Brackets, &c.

WEST SIDE HARDWARE COMPANY has succeeded Nish Bros. in the Shelf Hardware, Tinware, Paint, Sporting Goods and Plumbing and Heating business, at Elgin, Ill.

MODEL HOUSE FURNISHING GOODS DEPARTMENT.

THE Hardware store of G. E. Russell & Co., located in the thriving city of Holyoke, Mass., is in many respects a model retail establishment. The business was founded many years ago by Mr. Russell, whose death last year was a cause of genuine sorrow not only to his local business associates, customers and friends, but also to the New England Hardware trade at large, by whom he was honored and respected as a representative, progressive merchant, alert to grasp and apply to his own business the valuable features and ideas of the most modern merchandizing methods. Associated with Mr. Russell from boyhood, first as employee and then as partner, was A. J. Osborne, who has succeeded to the control and management of the concern. Mr. Osborne is one of the men who may be said to have a

Fig. 1.—General View of Floor Devoted to House Furnishing Goods.

Genius for Retail Business,

and a visit to his place in Holyoke could not fail to be stimulating and suggestive to any one engaged in a similar line. His talent shows itself not only in his management of the Hardware department, including Staples, Tools, Implements, &c., but especially in broadening out the business to embrace House Furnishing Goods, Fancy Metal Ware, Lamps, specialties, &c., which he stocks and handles on a scale rarely attempted by the average Hardware merchant. In this his store is a particularly good example of

A Well Recognized Tendency

in the trade to-day, no pains or expense being spared to make it as convenient and attractive as possible, not only to men but to women, whose trade is especially cultivated and solicited with most profitable results. Much emphasis has been laid by *The Iron Age* on the opportunities of developing the Hardware business in this direction, and no better example can be found of the success of such a policy than the establishment referred to in this article.

Passing by, at least for the present, all reference to the excellent facilities of this firm for handling and displaying shelf Hardware, Tools, Builders' Hardware and similar general lines, it is our purpose to refer at this time only to the House Furnishing Goods department, which indeed furnishes ample opportunity for profitable study. Some idea of the

Size and Scope of the Department

may be gained from the photographs herewith reproduced. Fig. 1 is a general view of the second floor of the store, which is entirely given up to household lines. Fig. 2 shows a smaller section of the same floor, containing selling assortments of Nickel Plated Tea Kettles, Coffee Pots, Tinware, &c. The Enameled Ware department is shown in Fig. 3, three different lines being carried—gray, blue and white—each occupying a separate triple deck display table. In Fig. 4 appears the section of wall shelving accommodating the less attractive lines of kitchen goods, such as Frying Pans, Dripping Pans, Cast Iron Hollow Ware, &c. Fig. 5 shows a large

Glass Counter Case

located on the main floor of the store, in which is displayed the exceedingly attractive stock of fancy ware, such as Cut Glass, Silver Ware, Chafing Dishes, Percolators, Thermometers, &c., all paying a handsome profit. It may well be imagined what an attraction this counter has for any one entering the store, and it is wisely located in the most prominent place. Behind it will be observed a large wall case, with several sliding glass doors, containing a handsome assortment of tools, such as Hammers, Hatchets, Bit Braces, Saws, Levels, Drawing Knives, etc.

A corresponding glass counter case on the other side

Fig. 2.—Stock of Nickel Plated Ware, Tinware, &c.

of the store, containing Carving Sets and other fine Cutlery, is shown in Fig. 6. Behind this appears a section of wall space fitted with natural wood shelf boxes with samples effectively arranged on their fronts. The stenciled marking on the shelf boxes and drawers indicating the goods which they contain could not be brought out in the photograph.

Convenient Arrangement.

Returning now to the House Furnishing Goods department on the second floor, special attention is commanded by the convenience of its arrangement. The triple deck tables already referred to were built to order for the places they occupy and of course correspond in size, construction and finish. The upper deck of each

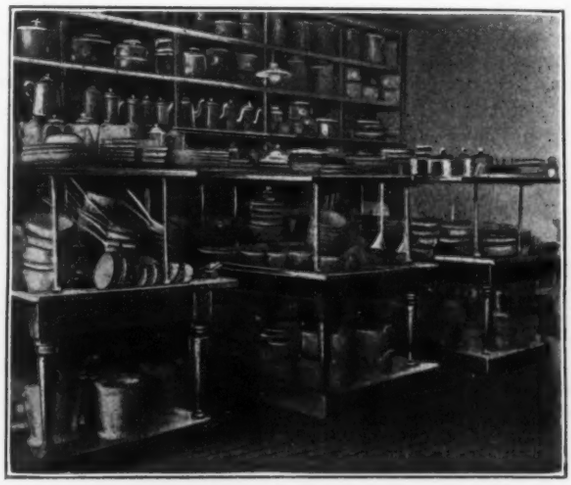


Fig. 3.—Stock of Enameled Ware, a Different Line on Each Table.

rests on upright metal posts, with collars at the top and bottom as shown in the illustrations. Between each table there is an aisle, wide enough for the convenience of customers and clerks in passing through. The wall shelving is also well arranged and easy of access. In conducting this department it has been found desirable to keep a

Separate Catalogue File,

which occupies the drawers shown at the left in Fig. 4. Here also are the records of the department buyer, including want book, order book, containing duplicates of

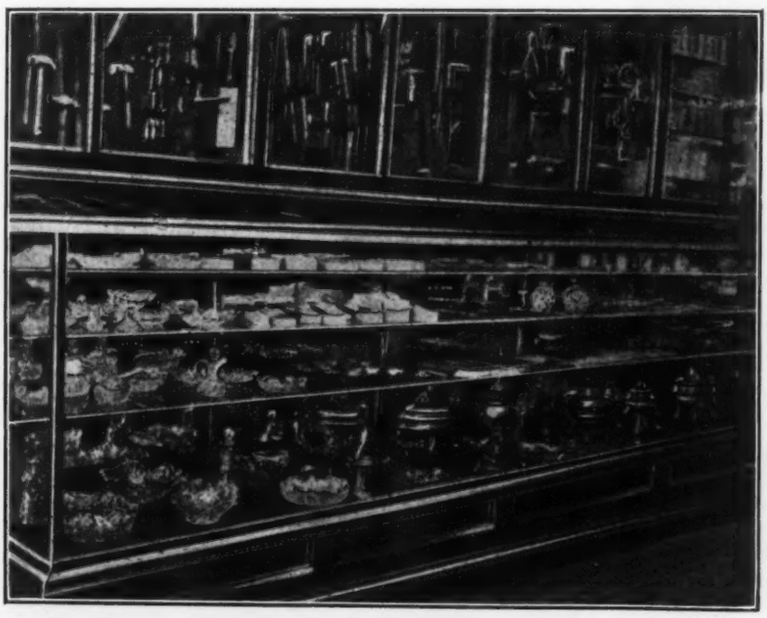


Fig. 5.—Showcase Containing Cut Glass, Chafing Dishes, Percolators, &c., with Tool Wall Case in the Rear.

orders given, invoices, records of costs, selling prices, etc.

The Methods of Cultivating Trade

and handling stock employed by Mr. Osborne may be covered by the statement that his standard requires the most careful, intelligent and high grade service that can be given. Conducted along these lines the house furnishing goods business has been built up to a profitable basis, and he does not propose to let it deteriorate in any respect. Indeed, the tendency is the opposite, and encouragement is found for expanding the scope of the department from time to time. For instance, it is expected shortly to add an attractive line of China and Crockery. The highest grade goods are carried in every line, the object being to provide particular trade with a class of goods not to be found, at least in great variety,

Fig. 4.—Stock of Frying Pans, Dripping Pans, Iron Kettles, &c., with Department Catalogue File in Drawers at the Left.

in the average store. Much attention is paid to the matter of

Intelligent Salesmanship,

the importance of which cannot be overestimated, especially in pushing the sale of more expensive articles as against cheaper ones which customers might be likely to take unless the merits and advantages of better goods were suggested and explained. When a customer asks the price of a Wringer, Tea Kettle or Coffee Pot, for instanse, he is *Always Quoted on the Best* and highest priced article of the kind in stock. Then, of course, if necessary, it is possible to come down to something a little cheaper if the customer is unwilling to pay the figure named. Usually, however, it is easy to convince him that he will get better value by paying the highest price.

Giving Personal Attention to Trade

is a matter which Mr. Osborne considers exceedingly important. He believes that the proprietor of a retail store can accomplish more for the business by meeting customers and waiting on them personally wherever possible than he can in his managerial capacity.

"If you cannot attend to both," says Mr. Osborne, "hire a manager and buyer and attend to the clerking yourself. People like to trade with the proprietor of a store or, at least, to see him around and have him take some notice of their patronage. When things go wrong it is especially important that the proprietor should be in close touch with the selling force. Then he will know of any dissatisfaction or complaints and can be sure that proper adjustment is made, so that customers will not feel disgruntled. If a proprietor shuts himself up in his office he is certain to be in the dark about many matters which are going on in the store. People will never hunt him up with complaints. Because of some trifling matter not tactfully handled by a clerk they may become sore and stay away from the store altogether. Thus customers of great value may be lost by one firm and gained by a competitor. If, however, the proprietor is always about and accessible to everybody his customers will come to have a personal feeling toward him which will show distinctly in the frequency of their calls."

Cleanliness and Order

are the final points emphasized and insisted on by the management of this establishment. It is the duty of every clerk to see that stock is always arranged in the most neat and attractive manner and that goods, counters, showcases, &c., are kept well dusted and absolutely clean. The ladies whose patronage is so greatly desired and solicited must be able to walk about the store and even brush against goods and counters without danger to their dresses, while they must be able to handle any articles in which they are interested without soiling their gloves. This is a point often overlooked in a Hardware store, but it is an important one

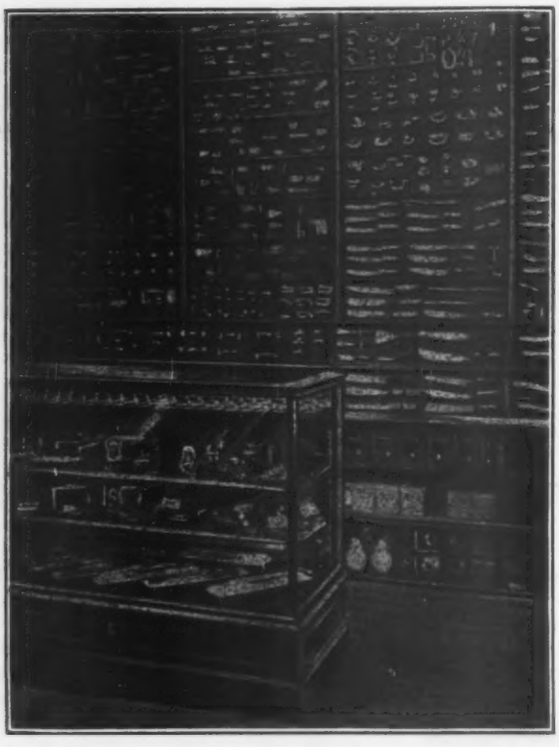


Fig. 6.—Showcase Containing Carving Sets and Cutlery, with Shelving in the Rear.

and if properly attended to is certain to have a favorable effect upon customers.

Storage Facilities.

Concluding this article, it is pertinent to explain that where salesrooms are kept up in the manner which has been described, it is of course necessary to have plenty of room for surplus stock, dirty, heavy and bulky goods, &c., in other quarters. The firm has ample storage space on the three floors above its salesrooms as well as in the basement, and a separate storehouse and salesroom are maintained for bulky lines, such as implements and vehicles.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

GREENE, TWEED & Co., 109 Duane street, New York: Illustrated catalogue of Brass Specialties, containing 170 pages. Some former patterns have been omitted, and many new styles added, together with innumerable additions of both larger and smaller sizes. The line includes Hinges, Lifts, Hooks, Catches, Turns, Bolts, Corners, Fasteners, Numbers, Brackets, Holders, Hasps, Escutcheons, Handles, Pulleys, Cleats, Pulls, &c., in great variety.

WILLIAM JOHNSON, Newark, N. J.: Price sheet illustrating and listing an extensive line of brick and plastering Trowels, Masons' Jointers, Masons' Tool Bags, &c. Special attention is called to Trowels Nos. 185, 186 and 186P, which have extra wide heels, and are peculiarly adapted to the requirements of workmen.

GRAHAM MFG. COMPANY, Derby, Conn.: Catalogue No. 12, relating to Keys, Checks, Lock Strikes, Bell Cranks, Padlocks, Trunk Locks, &c.

SOUTHERN STOVE WORKS, Richmond, Va.: Catalogue No. 12, illustrating and describing the Tip Top line of Stoves and Ranges, including Cast Iron Cooks, Ranges and Heaters, Air Tight Wood and Coal Heaters. The catalogue also refers to Stove supplies, such as Casters, Stove Boards, Polish, Pots, Pans, &c.

R. WOODMAN MFG. & SUPPLY COMPANY, Boston, Mass.: Illustrated catalogue and price-list of Ticket Punches and railroad, traction, hotel and steamship supplies, including Badges, Checks, Lead Seals and Wires, Daters, Perforating Machines, Tally Registers, &c.

HART & COOLEY COMPANY, New Britain, Conn.: Illustrated catalogue B, referring to H. & C. metal Lockers, which are made in several types and a wide range of sizes. The catalogue fully describes the construction of the Lockers, locking devices, &c., and gives all necessary information for ordering.

GEM MFG. COMPANY, Pittsburgh, Pa.: Supplement to bulletin No. 3, referring to Meg indestructible polished steel Oilers, screw top Engineers' Fillers, steel tallow Pots, brazed steel pyramid Torches, &c.

AMERICAN STEEL & WIRE COMPANY, Chicago, Pamphlet containing price- lists and tables referring to W. & M. Telephone Wire.

KLEIN-LOGAN COMPANY, Pittsburgh, Pa.: Illustrated catalogue covering a complete line of Picks and Mattocks, Hoes, Hammers, Sledges, Wedges, Bars and Blacksmiths', Mining and Railroad Track Tools, &c.

WHITE LILY MFG. COMPANY, Davenport, Iowa: Illustrated catalogue referring to the White Lily Gasoline Engine and calling especial attention to its adaptation to the requirements of the farm.

CLENDENIN BROS., Baltimore, Md.: Illustrated catalogue referring to an extensive line of Soldering Coppers for all purposes; also Plumbers' Hatchets and Swivel Hatchet Coppers, Gas Soldering Tips with Nipples, Copper Hammers, &c.

AMERICAN POST COMPANY, Bloomfield, Ind.: Illustrated booklet referring to Galvanized Tubular Metal Fence Posts, and showing the method of setting, bracing and attaching fence.

GOULDS MFG. COMPANY, Seneca Falls, N. Y.: Illustrated booklet referring to Columbia, Thresher and Star Force Pumps, Well Lift Pumps, Hydraulic Rams, Yard Hydrants, &c. Also calendar for August.

ACME SHEAR COMPANY, Bridgeport, Conn.: Illustrated catalogue and price-list referring to a complete line of Solid Steel and Cast Shears, Scissors and Tinners' Snips, including several new patterns.

BRANDT CASHIER COMPANY, Chicago: Illustrated circular referring to the Brandt Automatic Cashier, a machine operated by keys, which is said to count, gather and put into pay envelopes any required amount of coin.

H. G. OSBORNE, 74 Cortlandt street, New York: Booklet describing Osborne Extension Brick Drills and giving full information concerning sizes, net prices, methods of packing, &c. New ways of drilling holes through brick walls by means of drill heads are explained, and special articles are devoted to the application of these tools to the work of plumbers, electricians, steam fitters, &c.

THE SESSIONS CLOCK COMPANY, Forestville, Conn., has added a department for the manufacture of Marine Clocks, resuming in Forestville an industry which had its beginning there. In 1848 Banbridge Barnes succeeded in perfecting a marine movement, which gave satisfactory results, and a company was formed to manufacture it, producing the first Marine Clocks that the world had known. Eventually the business suffered a decline, and finally disappeared in Forestville, only to be resumed in 1908 by the Sessions Clock Company.

Chamberlain Cost Keeper.

The Dey Time Register Company, Flatiron Building, New York City, has recently added to its extensive line of Time Recorders the Chamberlain Cost Keeper, shown in Fig. 1. The company has for some time made a Cost Keeper that would record on a separate card the time spent by a workman on a single job. The feature of the new machine is that it will record on one card or sheet decimally the elapsed time a workman spends on the various jobs of a day, eliminating the large number of cards necessary where a separate card is used for each operation. Another condition which the machine meets is where manufacturing work is of such a nature that a time sheet must be issued to follow an order through the plant, accumulating time as the work progresses. With this clock it is possible to get a record of the elapsed time each man works on this job entered directly opposite his number, so that when the job is completed, this one ticket has recorded on it the total labor time consumed in its production, this doing away with the clerical work of transcribing and compiling records from various cards, slips, &c. Possible errors in transcription are also avoided, the records being produced in such a form that the original figures can be filed for reference. Where piece work is done and a coupon tag is used indicating the price paid and the number completed, the time consumed can be recorded on this coupon permitting a comparison of the piece price with the daily wage system. To sum up, it is stated that this cost clock will record time decimally on any kind of a time card or sheet, and will record as many times as may be required. While the portion of record card reproduced in Fig. 2 is a convenient and popular form of record, it represents only one of a great variety which may be used in the machine, according to the requirements of different manufacturers. Any kind of recording wheels can be furnished, but the standard is one having the minute wheel divided into hundredths instead of sixtieths of an hour, with an hour wheel which records from 1 to 23 hr., eliminating the noon hour instead of recording 1 to 12 and 1 to 12 again. The noon hour is automatically deducted. Referring to Fig. 1 a flat or table surface will be seen in the front of the machine; this is 3 in. wide and 12 in. long. Behind and directly above is a metal plate containing a guide, by the use of which the record may be properly spaced. When the sheet is put in place on the table, the lever located at the left is pulled down, releasing a hammer which will always give a uniform blow, ringing a bell, and making the record at the top of the sheet. For the next record, the sheet is merely moved to the right as long or as short a distance as necessary to bring the entry in the proper place. Having the beginning time, B, below the stopping time, S, makes subtraction easy to obtain the elapsed time, which is figured in the next column to the left. As this is automatically given in decimals, it is only necessary to multiply by the hourly rate to get the cost of the operation.

Fig. 1.—Chamberlain Cost Keeper.

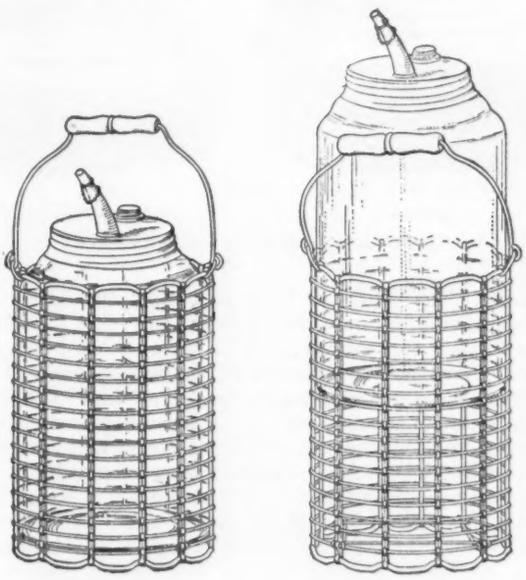
NAME James Morris		No. 27			DATE JAN 31 1908			RATE 30¢	
ARTICLE OR DESCRIPTION	OPERATION	QUANTITY	ACCEPTED	REJECTED	PARTS NO.	ORDER NO.	AMOUNT	ELAPSED TIME	CLOCK RECORD
Spindles	Drilling	9	9		H-4-1	702	.354	1.18 to 35.40	8.860 to 8.750
Levers	Slotting	57	57		H-11-1	698	.930	1.18 to 39.50	8.970 to 9.060
Spindles	Milling	100	98	2	H-9	647	.396	1.32 to 37.29	8.110 to 8.970

Fig. 2.—Cost Sheet, Showing Record Kept with Chamberlain Cost Keeper.

THE ROGERS & BALDWIN HARDWARE COMPANY, Springfield, Mo., wholesale Shelf and Heavy Hardware, has decided to increase its capital stock from $175,000 to $200,000. Plans are now under way for the enlargement of the store and the installation of modern handling facilities. The business was established in 1884, being first incorporated in 1901, and is now one of the most important institutions of its kind in southern Missouri. The territory covered by its salesmen includes Missouri, northern Arkansas, Oklahoma and Kansas, and in addition to goods comprised in regular Hardware stocks, the company handles a line of farm Implements, having the agency for several well known brands of Plows, Cultivators, Corn Planters, &c.

Hold 'Em Oil Can.

The Worcester Wire Novelty Company, Canton, Ohio, has added to its line of Hold 'Em specialties the oil can shown in the accompanying illustrations. The can, which is of glass, is held and protected by a wire jacket with bail, from which it may be readily removed, as shown in Fig. 2. The jacket is made of heavy wire, and has double steel ribs running vertically, to which the horizontal wires are securely bound at each intersection. The company states that the cans are calculated to withstand all the knocks and jars to which they are likely to be subjected in ordinary use.



Can in Place. Removing Can.

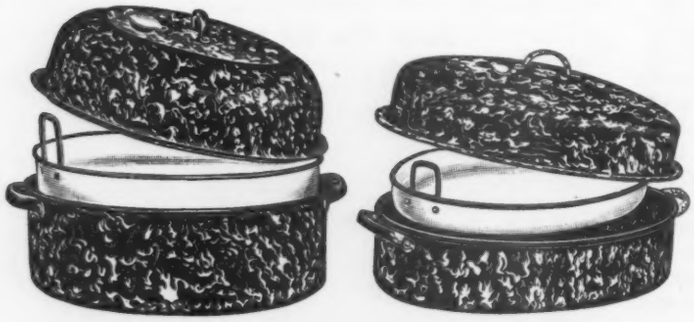
Hold 'Em Oil Can.

Rollis Parallel Jaw Pin Vise.

The M. W. Robinson Company, 79 Chambers street, New York, has added to a well selected assortment of fine mechanics' hand tools the Rollis Pin Vise in Nos. 3 and 4. It has parellel jaws, drop forged of steel, and the handle, which is hollow, so wire or rods can pass through its center, has the marked advantage of countersunk or beveled openings at each inner end, the material used thus having quick and easy access whichever way it is inserted. This tool is especially serviceable for machinists, jewelers, &c., and is polished and nickel plated.

Delft and Van Dyke Enameled Roasters.

The enameled roasters here represented are being put on the market by the Simmons Hardware Company, St. Louis. The Delft is blue as the name implies, and the Van Dyke is brown. Two shapes are offered, round and oval, as illustrated. The company states that the utensils are triple coated, guaranteed against chipping and leaking as well as against the action of any acids, and that they are full size. The lower section, cover and removable meat pan, are seamless, and the handles are



Round. Oval.

Delft and Van Dyke Enameled Roasters.

riveted. The bottom or lower section of the roaster has four indentations on which the meat pan rests, thus leaving a space between them which prevents the inner pan resting on the flat surface of the bottom. This, it is explained, gives it a uniform circulation of heat. The meat pan is white enamel and has a smooth bottom so arranged that at all times juices and steam will gather in the center, thus causing the meat to lie constantly in the juice and prevents burning. As the juice and steam continue to baste after being in a uniformly heated oven for 1½ hr., the meat is said to become tender and well flavored. The roaster has no crevices or corners in which grease, &c., can gather, and is therefore sanitary and easy to clean.

Monitor Glass Cutter No. 100.

The Millers Falls Company, Millers Falls, Mass., is manufacturing the glass cutter illustrated herewith. The tool has a revolving turret provided with seven cutter wheels, which can quickly be removed and replaced as they become dull. A further valuable feature to which attention is called is that the axles upon which the cutter wheels revolve can be removed and replaced if they become worn. The cutter frame is made of steel stock highly polished and nickel plated, while the handle is of polished cocobola. The turret is made of steel and is held in place by a knurled thumb nut on the back of the frame. It is revolved to bring the cutter wheel in correct position by simply loosening the thumb nut. The cutter wheels are made of the best steel available, and are scientifically hardened. The manufacturers state that every wheel is carefully tested before it is sent out.

Monitor Glass Cutter No. 100.

THE WHEELING CORRUGATING COMPANY, Wheeling, W. Va., and 47 Cliff street, New York, has arranged with C. E. Schofield, formerly manager of the New York store of Merchant & Evans Company, Philadelphia, Pa., to become sales manager of its New York City department. Robert Joy, who was formerly in charge of this department, will hereafter give his attention principally to the export trade. Both Mr. Joy and Mr. Schofield are men of long and varied experience in the sheet metal trade.

Yale Cloak and Hat Trees, Racks, Etc.

The illustrations herewith show examples of the line of metal cloak and hat racks and trees, made by Victor

Fig. 1.—Yale Coat and Hat Tree No. 69.

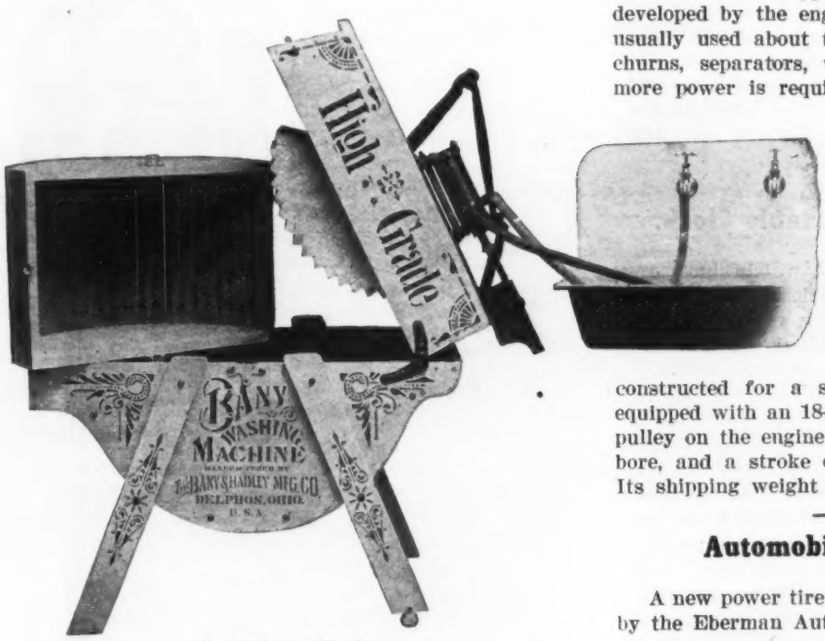
Fig. 2.—Yale Wall Cluster Rack No. 66.

Fig. 3.—Yale Coat and Hat Hook No. 41.

M. Grab & Co., Chicago. Fig. 1 represents the Yale cloak and hat tree. It is so constructed as to occupy very little space and is arranged to hold hats, coats and wraps of any sort, as well as umbrellas. Notwithstanding it has strength enough to sustain a load of 200 lb., its weight is only 15 lb., and it is therefore easily moved from place to place as desired. It is built of steel and iron throughout and is finished in ebony, old iron finish, polished old copper or old brass. The hook cluster at the top revolves on a pivot making any part of it readily accessible even when placed in a corner. The central shaft can be extended affording an adjustment in hight of rack from a minimum of 53 in. to 72 in. over all. It can be quickly disassembled and arranged in compact form for shipping. In the rack here shown the hooks have a length of 11 in. and spread of 12 in., while the legs forming the base have a spread of 24 in. Fig. 2 shows a convenient wall cluster 12 in. in hight, with 6-in. projections, which is furnished in the same finishes as the tree. The clusters weigh 38 lb. per dozen and are packed in ¼-doz. boxes. Fig. 3 shows a single hook 9 in. high with 4-in. projections weighing 8 lb. per dozen and packed 1 doz. in a box. The line made by the company includes various other styles of trees and clusters.

Bany Power Washer.

The Bany & Hadley Mfg. Company, Delphos, Ohio, is just putting on the market the Washing Machine shown in the accompanying illustration. It differs from many other machines in that it is not a rotary washer, but has double acting rub boards working independently of each other, and in opposite directions, the operation of which is said to be similar to washing by hand. As shown in the illustration, the lower cylinder can be taken out when

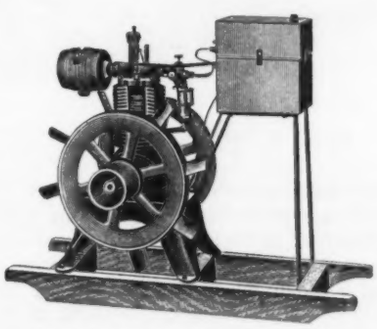


Bany Power Washer.

cleaning and drying the machine. Space is left between the lower cylinder and the bottom of the machine where dirt and lint may settle so that they are not kept in circulation among the clothes. The motor, attached as shown in the illustration, is guaranteed for one year, and is said to produce a maximum of power with a minimum of water pressure. It is stated by the company that rubbing of wrist bands and neck bands is unnecessary with this machine, and that anything from the finest fabric to the heaviest blankets can be washed without injury to the articles.

The White Lily Gasoline Engine.

The 3 hp. gasoline engine here illustrated is a late design manufactured and put on the market by the White Lily Mfg. Company, Davenport, Iowa. Extreme sim-



The White Lily Gasoline Engine.

plicity of construction coupled with lightness and ease of control are features that especially adapt it to the driving of machinery on the farm and in small shops. The engine is equipped with an automatic governor, which breaks the electric spark current when it cuts off the fuel, thereby effecting a considerable saving in burnt out spark coils, spark plugs and battery cells. It is air cooled by means of a series of wide flange rings on the cylinder supplemented by wing fans on the flywheel. The exact point of maximum explosion efficiency is maintained by a spark advance lever of the automobile type, which requires no skill or special knowledge of the mechanism to operate. Cranking of the engine is facilitated by use of the spark lever, which, it is claimed, starts it at once without the annoyance of kicking from back explosion. It can be compactly mounted with its tank on skids, as shown in the illustration, in which form it can be conveniently moved from place to place, and is ready to run when screwed to the floor or staked to the ground. The engine is applicable to different types of farm machinery, and the 3 hp. developed by the engine is sufficient for most machines usually used about the house or barn, such as pumps, churns, separators, wood saws, and the like. But if more power is required for driving heavier machinery the maker recommends the use of two 3 hp. units, with countershaft, making a twin engine plant. The advantage of this arrangement is that when required only for light service, fuel and power are saved by running each engine separately or one at a time as desired. The engine is 32 in. in hight over all, occupies a floor space 18 x 22 in., and is constructed for a speed of 550 rev. per min. It is equipped with an 18-in. flywheel, and carries a 5 x 5 in. pulley on the engine shaft. It has a cylinder with 4-in. bore, and a stroke of 4 in. with compression of 45 lb. Its shipping weight is 325 lb.

Automobile Power Tire Pump.

A new power tire pump recently placed on the market by the Eberman Auto Appliance Company, 1205 Monad-

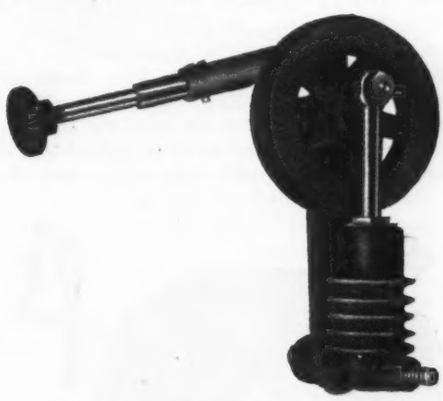


Fig. 1.—Automobile Power Tire Pump.

nock Block, Chicago, Ill., and illustrated herewith, has been designed to overcome all the labor and inconvenience incident to inflating tires by hand pumping inasmuch as it

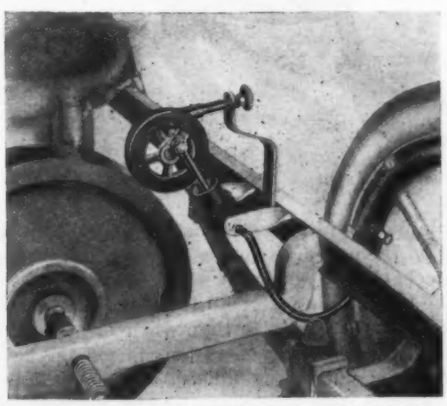


Fig. 2.—Pump Attached to a Car.

is operated entirely by power taken direct from the engine flywheel. The pump, as shown in Fig. 2, is permanently attached to the car in a position to be instantly put into

action when needed by simply pushing a lever. The power is taken from the engine flywheel, the engine being run at a speed of from two to three hundred revolutions per minute, or even faster, without any injury to the pump, as it is an oscillating, direct acting, single cylinder pump of few parts, and built to withstand the most severe service. If necessary the pump will, it is stated, compress air to 120 pounds pressure, and will inflate any ordinary tire to its full pressure in less than two minutes. The pump is small and compact, occupying a space of only 5 x 9 in., and may be attached in any position around the flywheel, depending upon the type of car and the space available for it. When the tire is ready to be inflated the air tube is connected to the valve stem, the engine is started at slow speed, and the pump is started by simply pressing the friction drive wheel against the engine flywheel, and in less than two minutes' time the tire is filled.

The Beyer Watchman's Portable Clock.

Because of the vigilant care and watchfulness required to guard against fire and other losses in commercial and industrial plants, the accuracy and dependability of time detectors designed to check the faithfulness of watchmen in the proper discharge of their duties is of the utmost importance. With a view to embodying every practical safeguard suggested by years of experience in the manufacture of such devices Hardinge Brothers, 1034-1036 Lincoln avenue, Chicago, Ill., have recently perfected the single record watchman's portable clock, shown in the accompanying illustrations. Among the new features designed to furnish added security are an embossed record made by a direct motion of the key, which leaves its imprint in the proper time space division without danger of working the recording dial loose upon its driving pins; and an automatic lock shutter and patent detective lock for the case. In Fig. 1 is shown the clock in its case, together with the case locking key and the key for unlocking the station box. The record on the dial is guarded by the recording lever on the side of the clock, and this cannot be operated until the key is properly inserted in its place. The latter is pressed in a direct line against the paper dial, and under the contact of male and female dies the letters and figures of the records are embossed on the paper, as shown in Fig. 2. Incorporated in this mechanism is a device which regulates the pressure of the key, making it at all times uniform. Another advantage claimed for it is that when once the key is inserted and the recording operation started the key cannot be removed until it is finished. The clock is also supplied with a new automatic closed keyhole, which shields the dial from exposure and the chance of being mutilated or improperly operated from without by false keys or other improvised instruments. Accuracy as a timepiece is quite important, and to secure this the clock is fitted with an 11 jeweled special movement with heavy plates and hardened pinions. It is finished with all the precision and accuracy of a fine watch, from which it differs only in size and strength. In Fig. 3 are seen the station box and key to be used in the clock, and the weighted chain to which the key is attached, and by means of which it is automatically drawn back into its place when released after using. The possibility of its being misplaced through design or otherwise is thus prevented, and the watchman has only to close the door, which is self-locking. To guard against the temporary removal of the cast iron station boxes from their fixed position they are fastened in place with three strong metallic seals held by six 1-in. screws, whose heads are covered and sealed so that they cannot be tampered with without detection. Both clock and station are, it is stated, inspected, numbered, labeled and approved by the Underwriters' Laboratories, Inc., and therefore carries the credits allowed on such devices.

Fig. 1.—The Beyer Watchman's Portable Clock.

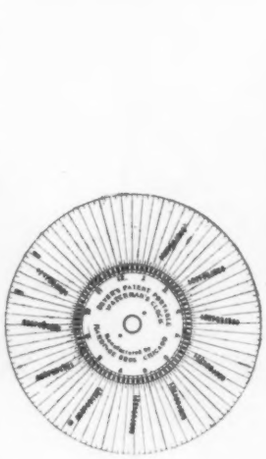


Fig. 2.—Paper Clock Dial.

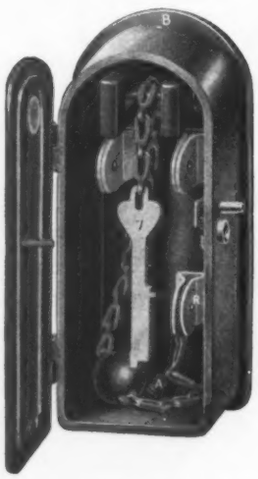


Fig. 3.—Station Box and Key.

Sidney No. 115 Concrete Barrow.

The Sidney Steel Scraper Company, Sidney, Ohio, has added to its product a new concrete wheelbarrow, as shown in the accompanying illustration. It has a deep riveted tray with angle, steel legs and braces, and metal tipped extension handles 69 in. long, 2½ in. wide and 1¼ in. thick. The tray is made of No. 16 gauge steel, and is 34 in. long by 22⅛ in. wide. It is 17½ in. on the slant in front and 9 in. in the back. Its capacity is 4 cu. ft. The wheel is 16 in. in diameter, with ⅜ x 1½ in. tire and eight ½-in. spokes. The axle is 11½ in. long and ⅝ in. in diameter. The shipping weight of this barrow is about 70 lb. It is also made as No. 116, with 14 gauge tray, the weight of which is 85 lb. These barrows are especially designed for the rapid, convenient and economical handling of soft concrete or mortar.

Sidney No. 115 Concrete Barrow.

Hoover Bros., St. Marys, Kan., have sold out their Hardware business to Morris Bros. & Chroninger, who are preparing to move into a new building about August 1.

The Yale Safety Razor.

The chief distinguishing feature of the safety razor made by the Yale Safety Razor Company, 3000 Lake Park avenue, Chicago, Ill., and here illustrated, is that it can be used with a free hand gliding stroke in the same manner as an ordinary razor. This, it is claimed, makes practice unnecessary to secure satisfactory results, and also renders difficult spots easy of access. The blades have double cutting edges, both of which can be used without changing position of the holder. They are fastened to the holder by a stationary pin and a retaining screw which engage the slotted ends. Adjustment is thus made positive and automatic, and the use of springs is entirely eliminated. Because of its simplicity and freedom of inaccessible holes and recesses no difficulty is experienced in keeping it clean, as both blade and holder can be quickly and easily wiped dry after using. An equally simple stropping holder is included in the set, by means of which the same set of blades can be kept in condition indefinitely. Stropping is recommended not so much for the purpose of sharpening as for polishing the cutting edge and keeping it free from the minute roughness caused by oxidation. The complete Yale safety

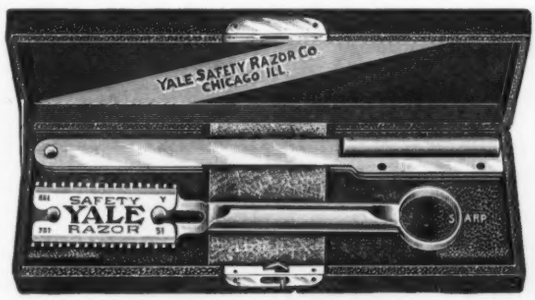


Fig. 3.—Yale Safety Razor Set.

razor set consists of a triple plated silver plate holder, nickel plated stropper and a set of Yale double edged blades packed in plush lined case.

The Victor Lemon Squeezer.

The Taplin Mfg. Company, New Britain, Conn., is putting on the market the lemon squeezer shown herewith. It is made of malleable iron, electro plated. It is

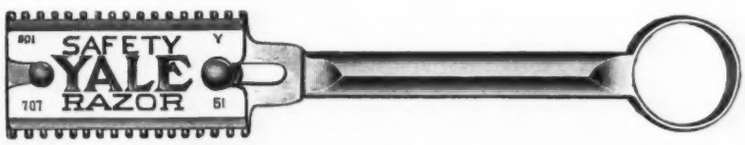


Fig. 1.—The Yale Safety Razor.

of strong, simple and compact design, easy to handle, and made for durability. Particular emphasis is placed on

Fig. 2.—Twelve Yale Safety Razor Blades.

the advantage of the check on the upper handle, which prevents the upper part of the squeezer being pressed down too far when in use.

JOHN H. GRAHAM & Co., 113 Chambers street, New York, have become sales representatives of the Hero

The Victor Lemon Squeezer No. 7.

Fruit Jar Company, Philadelphia, for both domestic and export trade. In addition to the complete line of Oilers made by this company, the firm will sell the fruit jar Caps, Can Screws, Sprinkler roses, Miners' Lamps, &c., of which the Hero Fruit Jar Company is a large manufacturer.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	℔ gal.	
Linseed, State and Western, raw		@42
City, Boiled		@46
City, Raw		@45
Raw, Calcutta, in bbls.		@..
Lard, Prime, Winter		@69
Extra No. 1		@56
No. 1		@52
Cotton-seed, Crude, f.o.b. mill		@35
Summer Yellow, prime		@45
Summer White		@49
Yellow Winter		@49
Tallow, Acidless		@55
Menhaden, Brown, Strained		@..
Southern		@..
Light Strained		@..
Bleached Winter		@..
Ex. Bleached Winter		@..
Cocoanut, Ceylon	℔ lb	@ 6½
Cochin	℔ lb	@ 7⅛
Cod, Domestic, Prime		@44
Newfoundland		@45
Red, Elaine		@41
Saponified	℔ &	5¾@ 5⅞
Olive, Yellow		@69
Neatsfoot, Prime		@58
Palm, Lagos	℔ lb	5¾@ 6

Mineral Oils—

	℔ gal.	
Black, 29 gravity, 25@30 cold test		@13½
29 gravity, 15 cold test		@14
Summer		@13
Cylinder, light filtered		@21
Dark, filtered		@19
Paraffine, 903-907 sp. gravity		@15
903 sp. gravity		@14
883 sp. gravity		@11½
Red		@14

Miscellaneous—

Barytes:		
White, Foreign	℔ ton	$18.50@20.50
Amer., floated	℔ ton	18.00@20 00
Off color	℔ ton	13.00@16.50
Chalk, in bulk	℔ ton	3.00@ 3.40
China Clay, Imported	℔ ton	11.50@18.00

	℔ gal.	
Cobalt, Oxide	℔ 100 lb	1.45@ 2.60
Whiting, Commercial	℔ 100 lb	.42@ .52
Gilders	℔ 100 lb	.55@ .60
Ex. Gilders	℔ 100 lb	.60@ .65

Putty, Commercial—℔ 100 lb

In bladders	$1.70	@1.80
In bbls. or tubs	1.20	@1.45
In 1 lb to 5 lb cans	2.65	@2.95
In 12½ to 50 lb cans	1.50	@1.90

Spirits Turpentine—℔ gal.

In Oil bbls		40½@41
In machine bbls		41 @41½

Glue—

	℔ lb	
Cabinet		@15
Common Bone		7½@ 9
Extra White		@24
Fish, liquid, 50 gal. bbls., per gallon		@1.20
Foot Stock, White		@14
Foot Stock, Brown		@11
German Common Hide		@12
German Hide		@18
French		@40
Irish		@16
Low Grade		@12
Medium White		@17

Gum Shellac—

	℔ lb	
Bleached, Commercial		@27
Bone Dry		@32
Button		@..
Diamond I		@48
Fine, Orange		@35
A. C. Garnet		@28
G. A. L.		@21
Kala Button		@19
D. C.		@49
Octagon B.		@40
T. N.		27½@29
V. S. O.		@48

Colors in Oil—

	℔ lb	
Black, Lampblack		@14
Blue, Chinese		@46
Blue, Prussian		@36
Blue, Ultramarine		@16
Brown, Vandyke		@14
Green, Chrome		@16
Green, Paris		@24
Sienna, Raw		@15
Sienna, Burnt		@15
Umber, Raw		@14
Umber, Burnt		@14

White and Red, Lead &c.—

	℔ lb	
Lead, English white, in Oil		10¼@10⅝
Lead, American White:		
Dry and in Oil, 100, 250 and 500 lb kegs		7
Dry and in Oil, 25 and 50 lb kegs		7¼
Dry and in Oil, 12½ lb kegs		7½
In Oil, 25 lb tin pails		7½
In Oil, 12½ lb tin pails		8
In Oil, 1, 2, 3 and 5 lb tin cans, ass't		9
Red Lead and Litharge:		
In 100 lb kegs		7
In 25 and 50 lb kegs		7¼
In 12½ lb kegs		7½
In lots of less than 500 lbs, ½¢ ℔ lb advance over above prices of White and Red Lead and Litharge.		

Lead, American. Terms: On lots of 500 lbs and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.

Zinc, Dry—

	℔ lb	
American, dry		5⅛@ 5⅝
Red Seal (French process)		6¾@ 7
Green Seal		7¼@ 7½
German Red Seal (French process)		6½@ 6⅞
Green Seal		7⅛@ 7½
White Seal		7¾@ 8⅛
French, Red Seal		8¼@ 8¾
Green Seal		10¼@10½

Dry Colors—

	℔ lb	
Black, Carbon		6½@10
Black Drop, American		3½@ 8
Black Drop, English		5 @15
Black, Ivory		16 @20
Lamp, commercial		4 @ 6
Blue, Celestial		4 @ 6
Blue, Chinese		31 @33
Blue, Prussian		29 @31
Blue, Ultramarine		3½@15
Brown, Spanish		½@ 1
Carmine, No. 40		$3.10@3.25
Green, Chrome, ordinary		3½@ 5
Green, Chrome, pure		17 @25
Ocher, American	℔ ton	$8.50@16.00
American Golden		2½@ 3¼
French		1¼@ 2
Foreign Golden		3 @ 4
Orange Mineral, English		10 @12
French		12½@13
German		12 @13
American		9 @10
Red, Indian, English		4½@ 6
American		3 @ 3¼
Red, Turkey, English		4 @10
Red, Tuscan, English		7 @10
Red, Venetian, Amer.	℔ 100 lb	$0.50@1.25
English	℔ 100 lb	$1.15@1.60
Sienna, Italian, Burnt and Powdered		3 @ 9
Italian, Raw, Powdered		3 @ 7
American, Raw		1½@ 2
American Burnt and Pow'd.		1½@ 2
Talc, French	℔ ton	$18.00@25.00
American	℔ ton	15.00@25.00
Terra Alba, French	℔ 100 lb	.90@ 1.00
English	℔ 100 lb	.80@ 1.00
American	℔ 100 lb, No. 1	.75@ .80
American	℔ 100 lb, No. 2	.60@ .65
Umber, T'key, Bnt. & Pow.		2¾@ 3
Turkey, Raw and Powdered		2¾@ 3
Burnt, American		1½@ 2
Raw, American		1½@ 2
Yellow, Chrome, Pure		13¾@15
Vermilion, American Lead		7 @25
Quicksilver, bulk		.65 @..
Quicksilver, bags		@65
English, Imported		.55 @70
Chinese		$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—
Columbian and Domestic....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—
Ives' Patent....35%
Taplin's Perfection....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—
Fernald Mfg. Co. Burton Anti-Rattlers, ℔ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ℔ doz. pairs ....$2.00@$3.00

Anvils—American—
Eagle Anvils....℔ lb @8½¢
Hay-Budden, Wrought....9½@9¾¢
Trenton ....℔ lb 9½@9¾¢

Imported—
Swedish Solid Steel Sisco, Superior, ℔ lb....10@10½¢
Peter Wright & Sons, ℔ lb, 84 to 349 lb, 11¢; 350 to 600 lb, 11½¢.

Anvil, Vice and Drill—
Millers Falls Co., $18.00....15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—
Livingston Nail Co....10%

Augers and Bits—
Com. Double Spur....75&10@80%
Jennings' Patn., Bright.65&10@70%
Black Lip or Blued...65@65&5%
Boring Mach. Augers....70%
Car Bits, 12-in. twist....40&10%
Ford's Auger and Car Bits....40&5%
Ft. Washington Auger Co,, Conard's 35%
Forstner Pat. Auger Bits....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list, 25&7½%
No. 30, R. Jennings' list....50%
Russell Jennings'....25&10&2½%
L'Hommedieu Car Bits....15%
Mayhew's Countersink Bits....45%
Pugh's Black....20%
Pugh's Jennings' Pattern....35%
Snell's Auger Bits....60%
Snell's Bell Hangers' Bits....60%
Snell's Car Bits, 12-in. twist....60%
Snell's King Auger Bits....50%
Wright's Jennings' Bits....50%

Bit Stock Drills—
See *Drills, Twist.*

Expansive Bits—
Clark's Pattern, No. 1, ℔ doz., $26; No. 2, $18....60&10%
Ford's, Clark's Pattern....66⅔&5%
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $26.00....60&10%
Swan's 60%

Gimlet Bits—
Per gro.
Common Dbl. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—
Bonney Pat., per doz..$5.50@6.00
Ames ....25&10%
Universal 20%

Ship Augers and Bits—
Ship Augers....40&10@—%
Ford's ....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' ....33⅓&7½%
Snell's 48%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—
Brad Awls:
Handled ....gro. $2.75@3.00
Unhdled, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket.gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—
Single Bit, base weights: Per doz.
First Quality....$4.75@5.00
Second Quality....$4.25@4.50
Double Bit, base weights:
First Quality....$7.00@7.50
Second Quality....$6.50@6.75

Axle Grease—
See *Grease, Axle.*

Axles— *Iron or Steel.*
Concord, Loose Collar...4¼@4½¢
Concord, Solid Collar....4½&5 ¢
No. 1 Common, Loose...3½@4 ¢
No. 1½ Com., New Style.4¼@4¾¢
No. 2 Solid Collar....4¼@4¾¢
Half Patent:
Nos. 7, 8, 11 and 12....70%
Nos. 13 to 14....70%
Nos. 15 to 18...70&10@70&10&5%
Nos. 19 to 22...70&10@70&10&5%

Boxes, Axles—
Common and Concord, not turned ....lb., 5@6¢
Common and Concord, turned, lb., 6@7¢
Half Patent....lb., 9½@10¢

Bait— Fishing—
Hendryx:
A Bait....20%
B Bait....25%
Competitor Bait....20&5%

Balances— Sash—
Caldwell new list....50&10%
Pullman ....50&10%

Spring—
Light Spring Balances..60@60&5%
Chatillon's:
Light Spg. Balances....50@50&10%
Straight Balances....40@40&10%
Circular Balances....50&10%
Large Dial....30%

Barb Wire—See *Wire, Barb.*

Bars— Crow—
Steel Crowbars, 10 to 40 lb.... per lb., 2¼@2½¢

Towel—
No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beam, Scale—
Scale Beams....40%
Chattillon's No. 1....30%
Chatillon's No. 2....40%

Beaters, Carpet—
Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ℔ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned....℔ doz, $1.50

Beaters Egg—
Dover Stamping & Mfg. Co.:
Genuine Dover, per gro., No. 1, Tumbler Size, $7.50; No. 2, Family Size, $7.50; No. 3, Extra Family Size, $24.00; No. 4, Hotel Size, $30.00.
Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd. $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.

Bellows—
Blacksmith, Standard List:
Split Leather....60&10@65%
Grain Leather....50@50&10%

Hand—
Net Prices.

Inch..	*6*	*7*	*8*	*9*	*10*
Doz..	*$5.00*	*5.50*	*6.00*	*6.50*	*7.50*

Molders—

Inch..	*10*	*12*	*14*	*16*
Doz..	*$7.50*	*9.00*	*12.00*	*15.00*

Bells— Cow—
Wrought Cow Bells....75%
Jersey ....75&10%
Texas Star....50%

Door—
Home, R. & E. Mfg. Co.'s....55&10%

Hand—
Polished, Brass....60@60&10%
White Metal....60@60&10%
Nickel Plated....50&10%
Swiss ....50&10%
Cone's Globe Hand Bells....33⅓@35%

Miscellaneous—
Farm Bells....lb., 2¼@2½¢
Church and School....60@60&10%

Belting— Leather—
Standard ....70&10@70&10&5%
Light ....75&10%
Cut Leather Lacing..60@60&10%
Leather Lacing Sides, per sq. ft. 20¢

Rubber—
Competition (Low Grade), 70&10@75%
Standard ....60&10@70%
Best Grades....40@50%

Bench Stops—
See *Stops, Bench*

Benders and Upsetters, Tire—
Green River Tire Benders and Upsetters 20%

Bicycle Goods—
John S. Leng's Son & Co.'s 1907 list:
Chain, Parts, Spokes....50%
Tubes 60%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks Tackle—
Common Wooden....75@75&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—
Paper and Wood Lined....55%
Embossed 55%

Boards, Wash—
See *Washboards.*

Bobs, Plumb—
Keuffel & Esser Co.... ....33⅓%

Bolts
Carriage, Machine, &c.—
Common Carriage (cut thread):
⅜ x 6 and smaller..75&5@—%
Larger and longer....70@—%
Phila. Eagle, $3.00 list...80@—%
Bolt Ends....70@—%
Machine (Cut Thread):
⅜ x 4 and smaller..75&10@—%
Larger and longer....70@—%

Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knobs:

Inch ...	*3*	*4*	*5*	*6*	*8*
Per doz..	*$0.30*	*.35*	*.45*	*.60*	*.80*

Cast Iron Spring Foot, Jap'd:

Inch	*6*	*8*	*10*
Per doz....	*$1.20*	*1.50*	*2.25*

Cast Iron Chain, Flat, Japanned:

Inch	*6*	*8*	*10*
Per doz....	*$1.00*	*1.40*	*1.65*

Cast Iron Flat Shutter, Jap'd, Brass Knobs:

Inch	*6*	*8*	*10*
Per doz....	*$0.75*	*.95*	*1.25*

Wrought Barrel Japanned, 80&10@80&10&5%
Barrel Bronzed....60&10%
Spring ....70&10@70&10&10%
Shutter ....50&5@50&10&5%
Square Neck....75@75&10%
Square ....70&10&10@80%
Ives' Patent Door....55%
Ives' Wrought Metal....45%

Expansion—
F. H. Evans' Crescent....40@60%
Richards Mfg. Co....55&10%
Steward & Romain Mfg. Co.:
Style No. 13, Double....60%
Style No. 1, Single....60%
Style No. 100, Dbl. Jaw, Single..55%
Lag Screw....66⅔%

Plow and Stove—
Plow ....65&5@70%
Stove ....85@85&5%

Tire—
Common Iron....80@80&5%
Norway Iron....80@80&5%
American Screw Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Bay State, list Dec. 28, '99....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Eclipse, list Dec. 28, '99....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99....80%
Norway Phila., list Oct. '84....80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99....80%
Phila., Eagle, list Oct. 16, 1884..82½%
Upson Nut Co.:
Tire Bolts....72½%

Borers, Bung—
Borers Bung, Ring, with Handle:

Inch....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch....		*2¼*		*2½*
Per doz....		*$8.65*		*11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each....25%

Boxes, Mitre—
C. E. Jennings & Co....25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme ....15&10%
Perfection 40%
Seavey 45%

Braces—
Comman Ball, American....$1.50
Barber's ....50&10&10@60&10%
Fray's Genuine Spofford's....60%
Fray's No. 61, 166, 208, 614....50%
C. E. Jennings & Co....50&5%
Mayhew's Ratchet....60%
Mayhew's Quick Action Hay Pat..50%
Millers Falls Drill Braces....25&10%
P., S. & W. Co., Peck's Pat....60&10%

Brackets—
Wrought Steel..75&10@75&10&10%
Bradley Metal Clasp..80&10@80&10&5%
Griffin's Pressed Steel....75@75&10%
Griffin's Folding Brackets....70&10%
Taplin Victor Handy Egg Beater Bracket ....℔ doz. $1.50

Bright Wire Goods—
See *Wire and Wire Goods.*

Broilers—
Kilbourne Mfg. Co....75&20%
Wire Goods Co....75%

Buckets, Galvanized—
M'fr's list, price per gross.

	Quart..	*10*	*12*	*14*
Water, Reg...		*26.85*	*29.50*	*33.50*
Water, Hvy...		*45.35*	*48.00*	*52.00*
Fire, Rd. Btm..		*32.00*	*34.65*	*38.65*
Well		*37.35*	*41.35*	*45.35*

10&7½&5&5%

Bull Rings—See *Rings, Bull.*

Butts— Brass—
Wrought, High List, Oct. 26,'06.55%
Cast Brass, Tiebout's....40%

Cast Iron—
Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint....70&10@75%
Loose Pin....70&10@75%
Mayer's Hinges....70@70&5
Parliamnt Butts....70@70&5

Wrought Steel—
Bright.
Light Narrow, Light Reversible ....70&5%
Reversible and Broad..70&5%
Loose Joint, Narrow, Light Inside Blind, &c....70%
Rack Flaps, Table Chest..65%
Japanned.
Light Narrow, Loose Pin, 40&5%
Light Narrow, Ball Tip..60%
Broad ....40&5%
Steeple Tipped....70%
Ball Tipped....70%

Extra, 10@—

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900 ..... 30%
Hendryx Bronze: Series 700, 800.... 30%
Hendryx Enameled..... 35%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb.....4@4½¢
Sharp, 1 prong, per lb....4½@5¢
Burke's, Blunt, 4@4¾¢; Sharp, 4½@5¼¢
Lautier, Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....per M 34@35¢
F. L.....per M 40@42¢
G. B.....per M 48@50¢
Musket .....per M 62@63¢

Primers—

Berdan Primers, $2 per M..20&5%
Primer Shells and Bullets..15&10%
All other primers per M..$1.52@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd. $1.90
B. B. Caps, Round Ball.....$1.49
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets..15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed .....65&10@70%
Plate .....60&5@60&10%
Philadelphia .....70&10@75%
Acme, Ball Bearing..... 35%
Gem (Roller Bearing).....70&10&10&5%
Steel Gem..... 50%
Standard Ball Bearing..... 45%
Yale (Double Wheel) low list...40&10%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	7-16	½	⅝
$8.15	5.55	4.60	3.95	3.75	3.65	3.55

¾-⅞-1 1⅛ to 1¼ inch.
$3.45 3.55

In cask lots, deduct 25¢.
German Coil.....60@60&5%
German Pattern Coil:
6-0 to 1.....70&5@70&10%
2 and 3..60&10&10@80&10&10&5%
4, 5 and 6.....50&10@50&10&5%

Halter—

Halter Chains.....60&5@60&10%
German Pattern Halter Chains, list July 24, '97....60&10&5@70%
Covert Mfg. Co.:
Halter ..... 35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.-

Traces, Western Standard: 100 pr.
6½—6-3, Straight, with ring..$28.00
6¼—6-2, Straight, with ring..$29.00
6¼—8-2, Straight, with ring..$32.00
6½—10-2, Str'ght, with ring..$37.00
NOTE.—Add 2c per pair for Hooks Twist Traces: add per pair for Nos. 2 and 3, 2c: No. 1, 3c; No. 0, 4c to price of Straight Link.
Eastern Standard Traces, Wagon Chain, &c...60&10@60&10&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron .....60&10&7½%
Brass 65%
Safety and Plumbers' Chain..75%
Gal. Pump Chain....lb., 4½@5%
Bridgeport Chain Co.:
Triumph Halter and Coil.35&2½@40%
Triumph Dog.....50&10@60%
Brown Halter and Coil....45@50&5%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion 40%
Oneida Community:
American Halter, Dog and Kennel Chains ..... 35&2½@40%
Niagara Dog Leads and Kennel Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain..... 70%
Universal Dbl. Jointed Chain.....50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain..... 60%
Pullman:
Bronze Chain, 60%; Steel Chain, Coppered ..... 60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft. .....$2.00@$5.00
Sash Ribbon Attachments, per set..8¢

Chalk— (From Jobbers.)

Carpenters' Blue.....gro., 50¢
Carpenters' Red.....gro., 45¢
Carpenters' White.....gro., 40¢

Checks, Door—

Bardsley's 45%
Pullman, per gro..... $54.00
Russwin 33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters, etc., Chests, with Tools 20%
Machinists' and Pipe Fitters' Chests, Empty..... 45%
Tool Cabinets..... 45%
C. E. Jennings & Co.'s Machinists' Tool Chests..... 7½%

Chisels—

Socket Framing and Firmer

Standard List.....80&10@—%
Buck Bros..... 30%

C. E. Jennings & Co.:

Socket Firmer No. 10.....25&7½%
Socket Framing No. 15.....25&7½%
Swan's ..... 66⅔@70%
L. & I. J. White & Co.....30@30&5%

Tanged—

Tanged Firmers.....80&5@35%
Buck Bros..... 30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White Co..... 25&5%

Cold—

lb.
Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary....9@10¢

Chucks—

Almond Drill Chucks..... 35%
Almond Turret Six-Tool Chuck.....40%
Beach Pat, each $8.00..... 35&5%
Empire 25%
Blacksmiths' 25%
Jacobs' Drill Chucks..... 35%
Pratt's Positive Drive..... 25%
Skinner Patent Chucks:
Independent Lathe Chucks..... 35%
Universal, Reversible Jaws..... 35%
Combination, Reversible Jaws....35%
Drill Chucks, New Model, 25%; Standard, 45%; Skinner Pat. 25%; Positive Drive..... 40%
Planer Chucks..... 20%
Face Plate Jaws..... 35%
Standard Tool Co.:
Improved Drill Chuck..... 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21..... 35%
Scroll Combinations, Nos. 83 and 84 ..... 30%
Geared Scroll, Nos. 33, 34 and 35..25%
Independent Iron, Nos. 18 and 318..35%
Independent Steel, No. 64..... 25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104..... 35%
Union Czar Drill..... 25%
Universal, 11, 12, 16, 17, 13, 14, 15..40%
Universal No. 42..... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50..... 35%
Steel Face Plate Jaws, Nos. 70 and 72 ..... 30%
Westcott Patent Chucks:
Lathe Chucks..... 50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill...50%
Little Giant Drill, Improved.....50%
Oneida Drill..... 50%
Scroll Combination Lathe..... 50%
Whitaker Mfg. Co.:
National Drill..... 25%

Clamps—

Adjustable Hammers..... 20@20&5%
Carriage Makers', P., S. & W. Co..... 50&10%
Besly, Parallel..... 33⅓&10%
Myers' Hay Rack..... 45%
Lineman's Swedish Neverturn.....65%
Wood Workers' Hammers.....40&10%
Saw Clamps, see Vises, Saw Filers'

Cleaners, Drain,

Iwan's Champion, Adjustable..... 50%
Iwan's Champion, Stationary..... 40%

Sidewalk—

Star Socket, All Steel..℔ doz. $4.05 net
Star Shank, All Steel..℔ doz. $3.24 net
W. & C. Shank, All Steel, ℔ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros..... 30%
Fayette R. Plumb..... 30%
L. & I. J. White Co..... 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Co.:
1902 Chicago Horse, each..$10.75
20th Century Horse, each...$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each..$20.00
Stewart's Enclosed Gear Horse, each..... $6.75
Stewart's Patent Sheep Shearing Machine, each..... $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75
} 20%

Clips, Axle—

Regular Styles, list July 1, '05, 80&80&10%

Cloth and Netting, wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c 75%
Compression Bibbs.....70%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list..... 40%
Leather, Walter B. Stevens & Son's list 10%

Compasses, Dividers, &c.

Ordinary Goods.....70&10@75%

Conductor Pipe,—

L. C. L. to Dealers:

	Gal. Steel.	Charcoal.
Northeastern	70&10%	50&10&7½%
Eastern	75%	50&10&7½%
Pittsburgh	75&10&5%	60%
Central	75&10%	60%
Northwestern	75&7½%	60%
Western	70&12½%	50&12½%
Tennessee	70&10%	50&12½%
Southern	70%	50&12½%
Southwestern	70%	50&5%

Terms, 60 days: 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:

Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90

Galvanized, Lined, side handles,

Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled..... 10%
Agate Lined..... 10%

Coppers' Tools—

See *Tools, Coopers'.*

Coppers, Soldering—

Soldering Coppers, 3 lb. to pair and heavier, 20¢; lighter than 3 lb. to pair.....22¢

Cord— Sash—

Braided, Drab.....lb. 35¢
Braided, White, Com., Nos. 8 to 12, 20¢; No. 7, 20½¢; No. 6, 21½¢. In lots of 12 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India.....lb., 11@11½¢
Cotton Sash Cord, Tw'ted..18@20¢
Patent Russia.....lb....20¢
Cable Laid Russia.....lb...21¢
India Hemp, Br'd'd.....lb...21¢
India Hemp, Twisted...lb.13@14¢
Patent India, Twisted..lb...17¢
Pearl Braided, cotton, No. 6, ℔ lb. 27½¢; No. 7, 26½¢; Nos. 8 to 12, 26¢; 7, 26½; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to 10.....℔ lb 23¢
Pullman:
Wire Sash Cord..... 10%
Sash Cord Attachments, per 100..$2.00
Samson, Nos. 8 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@ 50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord.....50¢ Massachusetts, White...℔ lb 40¢ Massachusetts, Drab....℔ lb 45¢ } 15%
Phoenix, White, Nos 8 to 12....27¢
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen....57½¢
See also Chain and Ribbon.

Wire, Picture—

Full Length.....90@—%
Short Length.....90&20@—%
Hendryx Standard Wire Picture Cord, old list. 85&10%
Turner & Stanton Co. Wire Picture Cord 90%

Cradles—

Grain 50%

Crayons—

White Round Crayons, Cases, 100 gro., $8.00, $8.50 and $9.00 according to grade.
Zelnicker's Lumber: ℔ gro.
White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.50
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks.....$10.00
Genuine Soapstone, Metal Workers', 5 in. x ¾ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ⅛ x 3-16, $2.50; 5 x 1¼ x 3-16.....$3.00
Suremark, Black, $2.25; Blue, Red and Yellow..... $2.50

Crooks, Shepperds'—

Fort Madison, per doz., Heavy, $5.50; Light $5.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden..... 50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847..℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....℔ doz. $3.00
Wm. Rogers & Son.....℔ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co..... 40%
Red Devil..... 60%
B. Mfg. Co..... 40%
Woodward 50%

Meat and Food—

American 30%

Nos.	401	402	403	404	405	406	407
Each	$5	$7	$10	$12	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

25@25&7½%
No. 202, $1.50..... 10&7½%
P., S. & W. Co.:
Dixon's .....℔ doz. 33⅓%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal ..... 40@40&5%
Hales ..... 60&10&5%
Little Giant.....℔ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$54.00	$72.00	$88.00

New Triumph No. 605, ℔ doz. $24.00, 40&10%
Russwin Food, No. 1, $24.00; No. 2, $27.00 ..... 45&10&10%

Enterprise Beef Shavers.....	$15.00	$18.00

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters..... 35%
Corn Graters..... 30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....℔ doz. $3.00
Combined Slaw Cutter and Corn Grater .....℔ doz. $4.00

Tobacco—

All Iron, Cheap...doz, $4.25@4.50
Enterprise ..... 25@30%
National, ℔ doz., No. 1, $21; No. 2, $18 ..... 40%

Diggers, Post Hole, &c—

Disston's:
Rapid, ℔ doz., $24.00..... 25%
Samson, ℔ doz., $34.00..... 25%
Iwan's Imp'ved Post Hole Auger..40%
Vaughan Pattern Post Hole Augers, ℔ doz., $7.00
Perfection Post Hole Diggers, ℔ doz. $8.75
Split Handle Post Hole Diggers, ℔ doz,, $7.75
Hercules Pattern, ℔ doz.....$10.00
Kohler's, ℔ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer.....$7.50
Never-Break Post Hole Diggers, ℔ doz., $24.00..... 60%

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers Emery Wheel—

Sterling Emery Wheel Dressers..... 35%
Sterling Wheel Dresser Cutters..... 35%

Drills and Drill Stocks—

Blacksmith's Common Drilling Machines .....$1.50@1.75
Breast, Millers Falls..... 15&10%
Breast, P., S. & W..... 33⅓%
Goodell Automatic Drills.50&10@60&10%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis..... 25%
Ratchet, Parker's..... 40%
Ratchet, Weston's..... 40%
Ratchet, Weston's, Style H Improved 40%
Ratchet, No. 012..... 40%
Ratchet, Celebrated..... 40%
Ratchet, Whitney's, P., S. & W. ..... 50&5%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00..... 33⅓%

Twist Drills—

Bit Stock.....70@70&5%
Taper and Straight Shank, 60&10@70%

Drivers, Screw—

Screw D'ver Bits, per doz..45@50¢
Balsey's Screw Holder and Driver, ℔ doz., 2¼-in., $6; 4-in., $7.50; 6-in. $9 ..... 50%
Buck Bros.' Screw Driver Bits..... 30%
Champion 50%
Disston's 70%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers....40&10%
Gay's Double Action Ratchet..... 35%
Goodell's Auto..... 65@65&10%
Mayhew's Black Handle..... 40%
Mayhew's Monarch..... 40%
Millers Falls, Nos. 20 and 21....25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
Smith & Hemenway Co., Neverturn, 66⅔%; Elmora, ... 30&10%
Swan's:
Nos. 7565 to 7568, 60%; No. 7540, 40&10%

Eave Trough, Galvanized—

	Charcoal. Iron.
Territory...Gal. Steel.	
Northeastern..75&10&5%	*60&20%*
Eastern.....80&2½%	*60&20%*
Pittsburgh..80&20%	*65&10%*
Central...80&10&10&2½%	*65&10%*
Northwestern..80&10&10%	*65&10%*
Western....80&10%	*60&10&5%*
Tennessee...80&5%	*60&10&5%*
Southern....80%	*60&10&5%*
Southwestern..75&10&2½%	*60&5%*

Terms.—2% for cash. Factory shipments generally delivered.
Note.—Lower prices are made in some sections.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. I. Standard Gauge.....85@85&10%
No. 26.....50%
No. 24.....25%
No. 22.....10%

Elbows, Stove Pipe—

Edwards, Standard Blue....40&10&10%
Edwards, Royal Blue..... 40&10&10%
Reeves, Dover, one piece.....40&10%

Emery, Turkish—

	¼ to ⅜:	½ to 200:	Flour.
Kegs .....lb.	5 ¢	5½¢	3½¢
½ Kegs.....lb.	5½¢	5¾¢	3¾¢
¼ Kegs.....lb.	5½¢	6 ¢	4 ¢
10-lb. cans, 10 in case....	6½¢	7 ¢	6 ¢
10-lb. cans, less than 10.....	10 ¢	10 ¢	8 ¢
Less quantity..	10 ¢	10 ¢	8 ¢

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice—

—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's .....50&10%
Walling's .....40&10%
Upson's Patent.....40%

Cord and Weight—
Ives and Titan.....33⅓%

Corrugated—
Acme Corrugated Fasteners.....70%

Faucets—
Cork Lined.....50&10@60%
Metallic Key, Leather Lined, .. 60&10@70%
Red Cedar.....40&5@40&10&5%
Petroleum .....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star 60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined..50%
John Sommer's Reliable Cork Lined.. 50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
Self Measuring:
Enterprise, ℔ doz. $36.00.....40&10%
Lane's, ℔ doz. $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Brands.....75&10@80%
Lower Grade....75&10&10@80&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....33⅓@40%

Fixtures, Fire Door—
Allith Underwriters' Approved.....50%
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 .....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz	*$3.60*	*3.85*	*4.15*	*4.65*

P., S. & W. Co.....25%
Reading Hardware Co.....60%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66⅔%
Victor, Header.....65%
Champion, Hay.....66⅔%
Champion, Header.....65%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley....40%
Plated.—See Spoons.

Frames— Wood Saw—
White, S'g't Bar, per doz. 75@80¢
Red, S'g't Bar, per doz. $1.00@1.25
Red, Dbl. Brace, per doz. $1.40@1.50

Freezers, Ice Cream—

Qt.....	*1*	*2*	*3*	*4*	*6*
Each....	*$1.25*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped.. 3.65
Waterproof Dbl. Taped.. 4.40
Waterproof Tpl. Taped.. 5.15
10&2½%

Gates, Molasses and Oil—
Stebbins' Pattern.....80@80&5%

Gauges—
Marking, Mortise, &c..30@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c.....50&50&10%
Disston's Marking, Mortise, &c..67½%
Wire, Brown & Sharpe's.....33⅓%
Wire, Morse's.....25
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $1.90; 2, $1.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $1.30; 2, $1.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....65@65&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush, 25&10@50%
Elwell's 40%

Grease, Axle—
Common Grade...gro. $6.00@$6.50
Dixon's Everlasting, 10-lb. pails, ea. 85¢; in boxes, ℔ doz., 1 lb, $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grinders—
Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 .....30%
Alundum Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A Combined, $6.50.....30%
Alundum Disc Grinders, each, $2.50 .....30%

Grindstones—
Pike Mfg. Co.:
Improved Family Grindstones, ℔ inch, ℔ doz., $2.00.....33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted.....40%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Halters and Ties—
Cow Ties.....65@65&10%
Bridgeport Chain Co.:
Triumph Coil and Halters.35&2½@40%
Brown Coil and Halters...45@50&5%
Brown Cow Ties.....50&5@50&10&5%
Brown Tie Outs.....70&10@75&5%
Covert Mfg. Co.:
Web .....30&2%
Jute Rope.....35%
Sisal Rope.....20%
Cotton Rope.....45%
Hemp Rope.....45%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters....45@50&5%
Niagara Cow Ties.....45&5@50&10&5%

Hammers—
Handled Hammers—
Heller's Machinists'....55&10@55&10&5%
Heller's Farriers.....40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel.....40&10%
Farriers' .....40&10%
Riveting .....40&10%
Machinists' .....60&10%
Blacksmiths' 50%
Fayatte R. Plumb:
A. E. Nail.....40&2½@40&12½%
Eng. and B. S. Hand.50&10&5@60&5%
Machinists' Hammers.....60@60&10%
Rivet and Tinners'.40&7½@40&12½&5%

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢...80&10%
3 to 5 lb., per lb., 40¢...80&10&10%
Over 5 lb., per lb., 30¢.....
Over 5 lb., per lb., 30¢.80&10&10%

Handles—
Agricultural Tool Handles
Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....40%
Fork, Shovel, Spade, &c.:
Long Handles.....40%
D Handles.....40%

Cross-Cut Saw Handles—
Atkins' 49%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—
Auger, assorted...gro. $3.00@$3.50
Brad Awl.....gro. $1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory.....$2.15@2.40
Socket Firming, Apple, $1.75@ $1.95; Hickory.....1.60@1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, &c., 60&10@60&10&5%
Hand Saw, Varnished, doz., 80¢ 85¢; Not Varnished.....65@75¢
Plane Handles:
Jack, doz., 30¢; Fore, doz...45¢
Chapin-Stephens Co.:
Carving Tool.....30@30&10%
Chisel .....60@60&10%
File and Awl.....60@60&10%
Saw and Plane.....30@30&10%
Screw Driver.....30@30&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle.... ℔ gro. $0.85@$1.50
J. L. Osgood:
Indestructible File and Tool, ℔ gro., No. 1, $8.00; No. 2, $8.50; No. 3, $9.00; No. 4, $9.50; No. 5, $10.00.....gro. lots 10%
W. A. Zelnicker Supply Co.:
Hammer, ℔ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 12., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, ℔ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe, ℔ doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze, ℔ doz., 36 in., $5.80; 36 in., $7.80.
Pick, ℔ doz., R. R., 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ℔ doz., 12 to 14 in., $2.00.

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable, Nos. 1 and 2; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door.....50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&2½%
Roller Bearing.....70&2½%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, 60&10%
Roller Bearing, Ex. Hy., No. 22, $18.00.....60&10%
Bull Dog, $24.00.....70%
Lane Bros. Co.:
Parlor, Ball Bearing, $1.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard.....60&10%
Hinged .....net $6.08
Covered .....60&5%
Special .....70&5%
Lawrence Bros.:
Advance .....55&10%
Cleveland .....70&7½%
Clipper, No. 75.....60%
Crown .....55&10%
Cyclone, No. 40.....net $6.50
Tandem, No. 50.....net $7.50
New York.....55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2, 70%
Anti-Friction 60%
Hinged Hangers, King Charm,60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12.$2.20
Roller B'r'g St'l Track No. 13.$2.50
Roller B'r'g, Nos, 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&5%
Trolley B, D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150.....$2.50
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 41..2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&5%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.25
Trolley B, D, No. 20.....50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½%
Anti-friction, No, 42; No. 44, sizes 2½ and 3.....60%
Hinged Tandem No. 48....60&5%
Folding Door B. B, Swivel No. 135 .....40%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%
Myers' Stayon Hangers.....60%

Extra 5&10% often given.

Hangers— Garment—
Pullman Trouser, ℔ gro., No. 1 $9.00; No. 4, $24.00; No. 5, $16.50; No. 8, Black Enamel, $7.50; No. 10, $21.00; No. 12, $8.00; No. 15, Rods, $9.00; No. 18, Loops.....$10.00
Victor Folding.....℔ gro. $9.60

Gate—
Myers' Patent Gate Hangers, ℔ doz. net $4.50

Joist and Timber—
Lane Bros. Co.....30%

Hasps—
Griffin's Security Hasp.....50&10%
McKinney's Perfect Hasp, ℔ doz..60%

Hatchets—
Regular list, first qual.40&12½@—
Second quality.....50&10&5@—

Heaters, Carriage—
Clark No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; **No. 3E, $3.25; No. 1, $3.50.....25%**
Clark Coal, ℔ doz., $0.75.....20%

Hinges—
Blind and Shutter Hinges
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's, Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair.....	*$0.75*	*1.35*	*2.70*

Mortise Shutter: (L. & P., O. S., Acme, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair....	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair.....	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ℔ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Shepard's Noiseless, Nos. 60, 65, 55 .....75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&5%
Tip Pat'n, No. 1.....75&10%
No. 3.....75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....70&10&5%
Shepard's Double Locking.....75%
Champion Gravity Locking.....75&5%
Pioneer .....75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L't'chs.	*$2.00*	*2.70*	*5.00*
Hinges only.....	*1.25*	*1.90*	*3.50*
Latches only.....	*.70*	*.75*	*.35*

New England:
With Latch.....doz..@$2.00
Without Latch.....doz..@$1.60
Reversible Self-Closing:
With Latch.....doz..@$1.75
Without Latch...doz....@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz..$1.15
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3.....70%

Pivot Hinges—
Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....50%

Spring Hinges—
Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, C'st Iron $6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....40%
Bardsley's Patent Checking.33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor..40%
Bommer Spring Hinges.....40%
No. 999 Wrot. Steel Hold Back, ℔ gro. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor.50%
Garden City Engine House...25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, ℔ gr., No. 14, $9.00; No. 18.....$25.00
Columbia, Adj., No. 7, ℔ gr.$12.00
Columbian Hinges.....60&10%
Gem, new list.....30%
Clover Leaf and Acoru, gro. lots, $5.10; ½ gro. lots.....$6.00
Oxford, new list.....30%
Floor Spring Hinges.....65&10%
Lawson Mfg. Co., Matchless...30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....℔ gr. $9.00
Chief Ball Bearings Floor Hinge 50%
Ball Bearing Door.....25%
No. 777, Sheet Steel Holdb'k, ℔ gr, pr.....$9.00
Standard Mfg. Co.:
Champion Double Acting Door Hinge .....25&10&10%
Standard Double Acting Floor Hinge .....25&10&10%
Superior Spring Hinge Co.:
Superior Floor Hinges.....33⅓%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges..50&10%
Heavy Strap Hinges..60&5%
Light T Hinges.....50%
Heavy T Hinges.....40%
Extra Hvy. T Hinges.50&10%
Hinge Hasps.....33⅓%
Cor. Heavy Strap....60&5%
Cor. Ex. Heavy T...50&10%

Extra 10&7½%

Screw Hook and Strap. { *6 to 12 in..lb. 3½¢* / *1½ to 20 in..lb. 3¼¢* / *22 to 36 in..lb. 3 ¢* }
Screw Hook and Eye:
¾, to 1 inch.....lb. 6½¢
⅝-inch .....lb. 7½¢
½-inch .....lb. 8½¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
M'f'gr's list, price per gross:

Inch	*15*	*16*	*17*	*18*
Galv. Open....	*$35*	*$38*	*$42*	*$46*
Jap. Open.....	*26*	*28*	*31*	*35*
Galv. Funnel...	*43*	*48*	*52*	*56*
Jap. Funnel....	*33*	*36*	*39*	*43*

10&7½&5%

Masons' Etc.
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $1.05
Steel Mortar, No. 158.....each $1.35

Hoes— Eye—
Scovil and Oval Pattern, 60&10@60&10&10%
Grub, list Feb. 23, 1899, 70&10@70&10&10%
D. & H. Scovil.....27½%
Am. Fork & Hoe Co. (Scovil Pattern) 60%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit.....$3.20
Ft. Madison Cotton Hoe....10&10&10%
Ft. Madison Crescent Cultivator Hoe, ₱ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. 40&5%
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz., 60&10%
Ft. Madison Dixie Tobacco Hoe.....75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.40
B. B., 6½ in.....$3.50
Acme Wedding.....₱ doz., net, $4.35
W. & C. L'tning Shuffle Hoe, ₱ doz. $5.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ₱ doz. $24.00.....45&10%

Door—

Bardsley's, Iron, 40%; Brass and Bronze 25%
Empire 50%
Pullman 25%
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip 50%
Superior 33⅓%

File and Tool—

Nicholson File Holders and File Handles .....33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, ₱ gross, $18.00; ₱ doz.....$2.00

Trace and Rein—

Fernald Double Trace Holder, ₱ doz. pairs $1.25
Dash Rein Holder, ₱ doz. pairs. $1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German.....33⅓%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Coat and Hat, Reading.....45&20%
Coat and Hat, Wrightsville.....60&5%
Harness, Reading List.....40%

Wire—

Belt 80%
Wire C. & H. Hooks..80@80&10%
Bradley Metal Clasp Wire, Coat and Hat, 70&10%; Ceiling.....70&10%
Columbian Hdw. Co., Gem.....70&5%
Parker Wire Goods Co., King..70&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $0.90; 8 in., $1.15.
Cotton .....*doz. $1.25@$1.50*
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see Stops, Bench.
Rush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz., $2.75@$3.00
Grass, common grades, all sizes, per doz .....*$1.25@$1.50*
Whiffletree .....*lb. 5¾@6¢*
Hooks and Eyes:
Brass .....60@60&10%
Malleable Iron.....70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks 40%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $3.25 net
Turner & Stanton Co. Cup and Shoulder .....85&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition .....*ft. 6@6¼¢*
3-ply Guaranteed.....*ft. 8¼@9¢*
½-ply Guaranteed....*ft. 9½@12¢*
Cotton Garden, ¾-in., coupled:
Low Grade.....*ft. 8@ 9¢*
Fair Quality.....*ft. 10@11¢*

Irons— Sad—

From ¼ to 10.....*lb. 2½@2¾¢*
B. B. Sad Irons.....*lb. 3¼@3½¢*
Mrs. Potts', cents per set:

	Nos. 50	55	60	65
Jap'd Tops	83	80	93	91
Tin'd Tops	88	85	98	95

New England Pressing..lb. 3¾@4¼¢

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%; Corner 60%

Pinking—

Pinking Irons.....*doz. 60@65¢*

Irons, Soldering

See *Coppers.*

Jacks, Wagons—

Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lockport 50%
Lane's Steel.....30&5%
Richards' Tiger Steel, No. 130....50&10%
Smith & Hemenway Co.'s.....25%

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Kettles—

Brass, Spun, Plain.....*20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co....60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60%
Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....*80&10@—%*
C. E. Jennings & Co., Nos. 45, 46, 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½%
Swan's .....66⅔@70%
Watrous 16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge, per doz. $5.00@5.50
Iwan's Sickle Edge.....₱ doz. $9.50
Iwan's Serrated.....₱ doz. $10.00

Miscellaneous—

Farriers' .....*doz. $2.60@3.55*
Wostenholm's .....₱ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch or Maple, Rubber Tip.....*gro. $1.25@1.40*
Carriage, Jap., Drive, all sizes, gro. 35@40¢
Door, Mineral.....*doz. 65@70¢*
Door, Por. Jap'd.....*doz. 70@75¢*
Door, Por. Nickel..*doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—

See *Belting, Leather*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....20%
P., S. & W.....40&10%
Reading 60%

Lanterns—Tubular—

Regular, No. 0.....*doz. $4.35@4.50*
Side Lift, No. 0.....*doz. $4.60@4.75*
Hinge Globe, No. 0. doz. $4.60@4.75
Other Styles.....*40@40&10%*

Bull's Eye Police—

3-inch .....*$3.75@4.00*

Latches— Thumb—

Roggin's Latches, Jap'd, with Screws .....*doz. 35@40¢*

Door—

Allith Mfg. Co., Reliable and Alligator, 50%; Reliable Cold Storage, 50%
Cronk & Carrier Mfg. Co., No. 101, ₱ doz. $2.00
Richards' Bull Dog, Heavy, No. 125 .....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....*doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E.....10%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.30*	*1.95*	*1.75*
75 feet	*$1.95*	*1.65*	*1.50*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₱ gr. 20%
Masons' Lines, Shade Cord, &c.; White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 .....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines, White Cotton....20%
Shade Cord, Cotton or Linen....20%

Locks— Cabinet—

Cabinet Locks....*33⅓@33⅓@5%*

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass .....75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass, 55&5%; Crescent, 60%; Iron, 60%; Window Ventilating, 40&20%; Robinson Pat. Ventilating Sash Lock, 33⅓%.
Pullman Patent Ventilating Lock..25%
Reading Sash Locks.....40%

Machines—Boring—

Com. Upr't, without Augers. .....*$2.00@2.25*
Com. Angl'r, without Augers. .....*$2.25@2.50*
Swan's Improved.....40&10%
Jennings', Nos. 1 and 4.....25&7½%
Millers' Falls.....5.75
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Invincible Hand Power... ₱ doz. $48.00

Fence—

Williams' Fence Machines....each. $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake 20%
Moore's Cyclone High Speed Chain Hoist 25%

Ice Cutting—

Chandler's 12½%

Washing

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rotary	$57.00
Champion Rotary Banner No. 1	$57.00
Standard Champion No. 1	$50.00
Standard Perfection	$27.00
Cincinnati Square Western	$33.00
Uneeda American, Round	$33.60

Mallets—

Hickory .....*45¢5@50%*
Lignumvitæ .....*45¢5@50%*
Tinners' Hickory and Applewood .....*doz. 45¢5@50%*

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Acme Flexible Steel.....50%
Elastic Steel (W. G. Co.), new list.50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....20@25%
National list Jan. 1, 1902.....30%
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side.....50&10%
Swift, Lane Bros. Co.....30%

Motors, Water—

Divine's Red Devil.....30%
Lippincott's 30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; advance 10¢ for each size.
Cheap, 10-in., $2.25; advance 15@20¢ for each size.
Better Grade, 10-in., $3.00; advance 25¢ for each size.

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Continental 60%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania 60%
Pennsylvania, Jr., Ball Bearing, 50&10&5%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel.....70%
Style B, Low Wheel.....70%
Style C, High Wheel, spcl. list, 70&10%
Style D, High Wheel, spcl. list..70%
Philadelphia:
Styles M., S., C., K., T....70&10&5%
Style A, all Steel.....60&10&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.40%
Horse .....40&5%
Pony .....40&5%
36-in. Horse.....30&10%
Eagle Horse.....30&5%
I. X. L. Horse.....50%

Nails—

Wire Nails and Brads, Miscellaneous .....*85¢5@85&10%*
Cut and Wire. See Trade Report.
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	...40&5%
Coleman	....	13	12	12	11	11 .....net
New Haven..	23	21	20	19	18	...40&5%
Livingston	..	19	18	17	16	16 .....10%

Western .....₱ lb 8½¢
Jobbers' Special Brands, per lb. 9¢

Picture—

	1½	2	2½	3 in.
Brass Hd. gro.	*.45*	*.55*	*.60*	*.70*
Por. Head, gro.	*..*	*1.10*	*1.10*	*1.10*

Upholsters—

Brass *30%*
Plated .....*30&10%*

Nippers—

See *Pliers and Nippers.*

Nipples—

Standard Nipple Co.:
Wrought Pipe Nipples....80@80&10%

Nuts— *Blank or Tapped.*

	Off list.
Cold Punched:	
Square	*5.40@5.50¢*
Hexagon	*6.00@6.10¢*
Square, C., T. & R.	*5.80@5.90¢*
Hexagon, C., T. & R.	*6.60@6.70¢*
Hot Pressed:	
Square	*5.80¢*
Hexagon	*6.30¢*

Oakum—

Best .....*lb. 6½¢*
U. S. Navy.....*lb. 6 ¢*
Navy .....*lb. 5 ¢*
Plumbers' Spun Oakum..2¾@3 ¢

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated.....*75%*
Chase or Paragon:
Brass and Copper.....*50&10%*
Zinc .....*65&10%*
Railroad .....*60&10&10%*
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%
Maple City Mfg. Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers—Packing Box—

Herculever, ₱ doz., $24.....30%

Can Openers—

	Per doz.
Sprague, Iron Handle	*30@35¢*
Sprague, Wood Handle	*40¢*
Sardine Scissors	*$1.75@3.00*

Yankee Can and Bottle Opener, ₱ doz., net, $0.75; Little Gem, ₱ doz., net.....$0.65

Egg—

Hartigan Nickel Plate, ₱ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope, any quantity.....*18@20¢*

Rubber—

(Fair quality goods.)

	1	*2*	*3*	*4*	*5*
Sheet, C. I					*11@12¢*
Sheet, C. O. S					*11@12¢*
Sheet, C. B. S					*12@13¢*
Sheet, Pure Gum					*40@45¢*
Sheet, Red					*40@50¢*
Jenkins' '96, ₱ lb. 80¢					25%

Miscellaneous—

American Packing....lb. 7@10 ¢
Cotton Packing.....*lb. 16@25 ¢*
Italian Packing.....*lb. 9@10¢*
Jute .....*lb. 4@4¼¢*
Russia Packing.....*lb. 9@10¢*

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List..*70&10@70&10&5%*
Edwards, Royal Blue.....65&7½%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos: *lb.*
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft..*2¼¢*
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.....*3½¢*
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in.....*3¢*
Per roll.
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll, 48@58¢
Medium weight, 30 lbs. to roll, 56@70¢
Heavy weight, 40 lbs. to roll, 75@78¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb., ton.....*$54.50*
Red Rope Roofing, 250 sq. ft. per roll.....*$1.75*

Tarred Paper—

1 ply (roll 400 sq. ft.), ton, $34.00@$38.00
2 ply, roll 108 sq. ft.....*65¢*
3 ply, roll 108 sq. ft.....*88¢*
Slater's Felt (roll 500 sq. ft.).80¢

Sand Paper and Cloth—

Flint and Emery.....*50¢10%*
Garnet Paper and Cloth.....*25%*

Parers—Apple—

Goodell Co.:
Family Bay State.....₱ doz. $15.00
Improved Bay State.....₱ doz. $36.00
New Lightning.....₱ doz. $7.00
Turn Table '98.....₱ doz. $6.00
White Mountain.....₱ doz. $5.00
Bonanza Improved.....each $7.50
Dandy .....each $10.00
Eureka Improved.....each $20.00
New Century.....each $20.00
Ranger .....each $25.00
Livingston Nail Co.:
Daisy .....₱ doz. $4.00
Little Star.....₱ doz. $5.00
Rocking Table.....₱ doz. $6.20
Reading Hardware Co.:
Advance .....₱ doz. $4.00
Baldwin .....₱ doz. $4.00
Reading 72.....₱ doz. $3.25
Reading 78.....₱ doz. $6.25

Potato—

Saratoga .....₱ doz. $7.00
White Mountain.....₱ doz. $6.00

Picks and Mattocks—

(List Jan., 1908.)

List .....*70&10@70&10&10%*
Cronk's Handled Garden Mattock, ₱ doz., No. 2, $2.60; No. 3, $6.40.

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass .....50@50&10%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in.....70@—%
Extra Heavy, 2-6 in..75&10@—%
Fittings, Standard and Heavy, 80&10@80&10&10%

Pipe, Merchant—

	Consumers, Steel. Blk.	Galv.	Carloads, Iron. Blk.	Galv.
	%	%	%	%
⅛ and ¼ in..	66	50	66	..
⅜ in.....	68	54	66	52
½ in.....	70	58	68	56
¾ to 6 in....	74	64	72	62
7 to 12 in....	71	56	69	54

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First-class 87%
Second-class 90%

Pipe, Stove—

Per 100 joints.	C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue....	$6.25	$7.25
6 in., Standard Blue....	6.75	7.75
7 in., Standard Blue....	7.75	8.75
5 in., Royal Blue.....	7.00	8.00
6 in., Royal Blue.....	7.50	8.50
7 in., Royal Blue.....	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color..	$6.15	$7.15
6 in., Uniform Color..	6.65	7.65
7 in., Uniform Color..	7.65	8.65

Planes and Plane Irons—
Wood Planes—
Bench, first qual.....30@30&10%
Bench, second qual....40@40&10%
Molding .....25@25&10%
Chapin-Stephens Co.:
Bench, First Quality.....30%
Bench, Second Quality.....40%
Molding and Miscellaneous.....25%
Toy and German.....30%
Union 60%

Iron Planes
Chaplin's Iron Planes.....50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06.....25%
Buck Bros.....30%
Chapin-Stephens Co.....25%
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse.....₱ doz. $8.00

Plates—
Felloe .....lb. 5¾@4¢

Pliers and Nippers
Button Pliers....75&5@75&10&5%
Gas Burners, per doz., 5 in., $1.25 @$1.30; 6 in., $1.45 $1.50.
Gas Pipe.. 7 8 10 12-in.
$2.00 $2.25 $2.75 $3.50
Acme Nippers.....50&5%
Cronk & Carrier Mfg. Co.:
American Button.....80%
Improved Button.....75&10%
Cronk's 60%
No. 80 Linemen's.....50%
Stub's Pattern.....45%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&5@40&10&5%
P., S. & W. Tinners' Cutting Nippers 40%
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.: Pliers and Nippers, all kinds....40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10%
Chaplin's Imp. Brass Cor..40@40&10%
Pocket Levels.....30@30&10%
Extension Sights.....30@30&10%
Machinists' Levels.....40@40&10%
Disston's Plumbs and Levels....60&10%
Disston's Pocket Levels.....60&10%
Stanley's Dulex.....35%
Woods' Extension.....33⅓%

Points, Glaziers'—
Bulk and 1-lb. papers....5@ 9 ¢
½-lb. papers.....lb. 9½¢
¼-lb. papers.....lb. 10 ¢

Police Goods—
Manufacturers' Lists..25@25&5%
Tower's 25%

Polish—Metal, Etc—
Prestoline Liquid, No. 1 (¼ pt.), ₱ doz., $3.00; No. 2 (1 qu.), $9.00...40%
Prestoline Paste.....40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gro. $4.50; ½ lb boxes, ₱ doz. $1.25; 1 lb boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz., $1.25.
Barkeepers' Friend Metal Polish, ₱ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ₱ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ₱ doz. 75¢
Black Jack Paste, ¾ lb cans, ₱ gr. $9.00
Black Kid Paste, 5 lb can...each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon, ₱ gr. $5.75.....10%
Dixon's Plumbago.....₱ lb 8¢
Fireside .....₱ gr. $2.50
Gem, ₱ gr. $1.50.....10%
Japanese .....₱ gr. $3.50
Jet Black.....₱ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ₱ doz. $1.50

Window Polish—
Benj. P. Forbes:
Glasbright, No. 2, gal pails, ₱ doz., $24.00; each, $2.50; 1 lb cans, each .....75¢
Glasbright Powder, bbls., ₱ lb..20¢

Poppers, Corn—
1 qt. Square..doz.$0.80; gro.$8.75
1 qt. Round..doz.$0.90; gro.$10.00
1½ qt. Square.doz.$1.20; gro..$12.00
2 qt. Square..doz.$1.50; gro..$15.00

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled 40%
Tinned .....30&10%

Powder—
In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb.....each 15¢
Rifle, 1 lb.....each 25¢
In Kegs:
12½-lb. kegs.....$3.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk).....	$12.00	$15.00
Half Keg (12½ lb bulk)..	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)..	14.00	17.00
Half case 12 (1 lb c. bk)..	7.25	8.75

Presses—
Fruit and Jelly—
Enterprise Mfg. Co.....20@25%
Seal Presses—
Morrill's No. 1, ₱ doz., $20.00.....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 50%
Miller's Falls, No. 3, ₱ doz., $12.00..
33⅓&10%
Morrill's No. 1, Nail Puller, ₱ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
The Scranton Co, Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B.....70%
Giant 50%
Staple Pullers, Utica and Davison 60%

Pulleys, Single Wheel—

Inch	1¼	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., ¼ in., $1.25; 5 in., $1.55				
Inch	2	2¼	2½	
Hot House, doz.	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz.	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz.	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz., 1¾ and 2 in.....17@20¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in....20@21¢
Acme, No. 35..1⅜ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain Axle .....50&10%
Wrought Steel, Eagle.....17@20¢
Top Notch, Electrically Welded, Nos. 3 and 4.....19¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ₱ doz. 50%
Grand Rapids All Steel Noiseless..50%
Niagara, No. 25, 1⅜ in., 19¢; 2 in. .....20½¢
No. 26 Troy..1⅜ in., 14½¢; 2 in., 16½¢
Star, No. 25....1⅜ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout.....75&5@75&10%
Wood Pumps, Tubing, &c....50%
Barnes Dbl. Acting (low list)....40&5%
Barnes Pitcher Spout.....75&10%
Contractors' Rubber Diaphragm, No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....₱ doz. $6.50
Flint & Walling's Fast Mail Hand (low list).....50%
Flint & Walling's Fast Mail (low list) 50%
Flint & Walling's Tight Top Pitcher .....75&10%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50.....30%
Myers' Pumps (low list).....40&5%
Myers' Power Pumps.....40&5%
Myers' Spray Pumps.....40&5%

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No.....	*1*	*2*	*3*	*4*	
	$5.00	6.00	7.00	8.00	30%
Cup Leathers—Per 100:					
Inch....	*2½*	*3*	*3½*	*4*	
	$5.00	7.00	9.00	12.00	

Punches—
Saddlers' or Drive, good, doz......50@75¢
Spring, single tube, good quality $1.75
Revolving (4 tubes)....doz.$3.50
Bemis & Call Co.'s Cast St'l Drive.50%
Morrill's Nos, 1AA, 1A, 1B, 1C, 1D, $15.00.....30%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Tinners' Hollow, P., S. & W. Co..40%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44.....40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron, 2½@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb., 36¢.....30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..₱ ft. 3¼¢
O. N. T. Rail.....$3.12
Griffin's:
xxx, ₱ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ₱ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ₱ 100 ft.....$3.45
O. N. T., ₱ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in.....₱ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ₱ 100 ft., $7.50; 1¼ x 3-16 in., $8.75.....55&7½%
McKinney's:
Hinged Hanger Track, ₱ ft., 11¢.. 60&5%
1 x 3-16 Track.....55&7½%
Myers' Stayon Track.....60&5%
Richards Mfg. Co.:
Common, 1 x 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail..60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ₱ ft., No, 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.75
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor.....80&25%
Queen City Lawn, ₱ doz., 20 teeth, $2.85; 24, $3.00.....net
Anticlog Lawn, ₱ doz.....$4.00
Malleable Garden.....70&10%
Ideal Steel Garden, ₱ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00.....60%
Kohler's:
Lawn Queen, 20-tooth....₱ doz. $3.15
Lawn Queen, 24-tooth....₱ doz. $3.25
Paragon, 20-tooth.....₱ doz. $2.70
Paragon, 24-tooth.....₱ doz. $2.75
Steel Garden, 14-tooth....₱ doz. $2.40
Malleable Garden, 14-tooth, ₱ doz. $2.00@2.25

Rasps, Horse—
Disston's 75%
Heller Bros.'.....70&5@70&10&5%
Liveright Bros.' Gold Medal.70&10@75%
McCaffrey's American Standard..... 60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—
Liana Bo-ras-ic.....60%
Fox Razors, ₱ doz., No. 42, $20.00; No. 44, $20.00; No. 82, Platina, $25.00. } Dis. 40%
Red Devil.....65%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum, German Silv., Bronze,.25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN 24 N 08 PN.....20%
2904 P., 33½%; 2904 PN., 33⅓%; 0924 N., 33⅓%; 02084 N., 33⅓%; 002904 PN., 33⅓%; 802 N., 33⅓%
986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed 70%
White Porcelain Enamel..50&10%
Solid Brass or Bronze Metal..40%

Revolvers—
Single Action.....85¢@$1.00
Double Action, except 44 cal..$2.00
Double Action, 44 caliber...$2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grade
16 in.....*per doz*.$2.50@$2.75
17 in.....*per doz*.$2.75@$3.00
18 in.....*per doz*.$3.00@$3.25

Rings and Ringers—
Bull Rings—

	⅞	1¼	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.10	1.25	1.65 doz.

Hog Rings and Ringers—
Hill's Rings, gro. boxes.$4.50@$4.50
Hill's Ringers, Gray Iron, doz., 60@75¢
Hill's Ringers, Malleable Iron, doz.80@95¢
Blair's Rings..per gro.$5.00@$5.50
Blair's Ringers...per doz.75@90¢

Rivets and Burrs—
Copper .....50@50&10%
Carriage, Coopers', Tinners', &c.: Black .....70&10%
Metallic Tinned.....70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, 23@25¢; Tin boxes, 100 count, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—
Cronk's Stay, No. 50.....$1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56, $0.75; No. 60.....$0.75
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%

Rope—
Manila, 7-16 in. diam. and larger: Pure .....lb. 9½@ 10¢
Sisal, 7-16 in. diam. and larger: Pure .....lb. 6¼@ 6½¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Pure .....lb. 6¾@7 ¢
Sisal, Tarred, Medium Lath Yarn: Pure .....lb. 5¾@6 ¢
Cotton Rope: Best, ¼-in. and larger...18@20¢
Medium, ¼-in. and larger.16@17¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope: Thread, No. 1, ¼-in. and up, lb. .....6¼¢
Thread, No. 2, ¼-in. and up, lb. .....5¾¢

Wire Rope—
Galvanized .....37½&2½%
Plain .....45&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal.....20%

Rules
Boxwood .....60@60&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory .....25@25&10%
Miscellaneous .....50@50&10%
Stephens' Combination.....55%
Stationers' .....50@50&10%
Keuffel & Esser Co.:
Folding, Wood.....35&10%
Folding, Steel.....33⅓&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....50&10%
Upson Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 45%
Band ..... 50@60&10%
Butcher Saws 50%
Cross Cuts 35%
One-Man Cross Cut 40%
Narrow Cross Cut 50%
Hand, Rip and Panel ..... 35&5%
Miter Box and Compass 40%
Mulay, Mill and Drag 45%
Wood Saws ..... 40&10%
Chapin-Stephens Co.:
Turning Saws and Frames ..... 30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth 50%
Band, 2 to 18 in, wide 60%
Band, ¼ to 1¾ 60%
Crosscuts 45%
Narrow Crosscuts 50%
Mulay, Mill and Drag 50%
Framed Woodsaws 25%
Woodsaw Blades 25%
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c 25%
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 16⅔%
Butcher Saws ..... 25&7½%
Compass and Key Hole Saws, 33⅓&7½%
Framed Wood Saws ..... 25&7½%
Hand Saws 12½%
Wood Saw Blades ..... 35⅓&7½%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&50%
Butcher Saws Blades ..... 35@40%
Peace & Richardson's Hand Saws 30%
Simonds':
Circular Saws 45%
Crescent Ground Cross Cut Saws 30%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws 45%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c ..... 25@25&7½%
Wood Saws ..... 40&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A 25%
Disston's:
Concave Blades 25%
Keystone Blades 35%
Hack Saw Frames 30%
Simonds File Co 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades ..... 40&10%
Griffin's Hack Saw Frames ..... 35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..... 30&10&5%
Sterling Hack Saw Frames ..... 30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00 ..... 10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%
Whitaker Mfg. Co.:
National Hand Blades 40%
National Hand Frames ..... 30&5%
National Power Blades ..... 30&10%

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00 ..... 15&10%

Scales—

Union Platform, Plain ..... $2.10@2.20
Union Platform, Stpd ..... $2.20@2.30
Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Trip Scales 50%
The Standard Portables 40%
The Standard R. R. and Wagon ..... 50&10%

Scrapers—

Box, 1 Handle ..... doz. $1.85@2.10
Box, 2 Handle ..... doz. $2.35@2.50
Ship ... Light, $2.00; Heavy, $4.50
Chapin-Stephens Co., Box ..... 30@30&10%
Richards Mfg. Co., Foot 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1¼, $3.50@3.75
Bench, Wood ..... 20@20&10%
Hand, Wood ..... 70&10@70&10&10%
Chapin-Stephens Co., Hand ..... 70@70&10&2½%

Coach, Lag and Hand Rail—

Lag, Cone Point ..... 80&5@80&10%
Coach, Gimlet Point ..... 80@80&5%
Hand Rail ..... 70&10@75%

Jack Screws—

Standard List ..... 70&10@75%
Millers Falls ..... 50&10&10%
Swett Iron Works ..... 70@75%

Machine—

Cut Tread, Iron, Brass or Bronze:
Flat Head or Round Head, 50@30&10%
Fillister Head ..... 40@40&10%
Rolled Thread, F. H. or R. H., Iron ..... 75&10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65&10%

Set and Cap—

Set (Iron) ..... 75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70&10&7½%
Hex. Hd. Cap ..... 70&10&7½%
Rd. Hd. Cap ..... 50&7½%
Fillister Hd. Cap ..... 60&7½%

Wood—

List July 23, 1903.
Flat Head, Iron ..... 87½&5@ ..%
Round Head, Iron ..... 85&5@ ..%
Flat Head, Brass ..... 80&5@ ..%
Round Head, Brass ..... 77½&5@ ..%
Flat Head, Bronze ..... 75&5@ ..%
Round Head, Bronze ..... 72½&5@ ..%
Drive Screws ..... 87½&5@ ..%

Scroll Saws—

See *Saws, Scroll.*

Scythes— *Per doz.*

Grass, No. 1, Plain $7.00
Clipper, Bronzed Webb $7.25
No. 3 Clipper, Pol'd Webb $7.50
No. 6 Clipper and Solid Steel $7.75
Bush, Weed and Bramble, Nos. 11, 12 and 13 ..... $7.25
Grain, No. 1 ..... $9.00@9.50
Bronzed Webb, No. 1 ..... $9.25@9.75
Nos. 3 and 4 Clipper, Grain, $9.50@10.00
Solid Steel, No. 6 ..... $10.00@10.50

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $16; 3, $12 ..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18 ..... 20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ₱ doz. sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 27½%
Cannon's Diamond Point, ₱ gro, $12, 40&10%
Mayhew's ..... ₱ gro. $9.00
Snell's Corrugated, Cup Pt ..... 40&10%
Snell's Knurled, Cup Pt ..... 40&10%
Victor Knurled, Cup Pt ..... ₱ gro, $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Morrill's No. 1 ..... $15.00 } 50%
Nos. 3 and 4, Cross Cut ..... $20.60 } 50%
No. 5, Mill ..... $30.00 } 50%
Nos. 10, 11, 95 ..... $15.60 } 50%
No. 1 Old Style ..... $10.00 } 50%
Special ..... $16.25 } 50%
Giant Royal Cross Cut ..... ₱ doz. $8.00
Royal, Hand ..... ₱ doz. $4.50
Taintor Positive ..... ₱ doz. $6.75

Shaving—

Fox Shaving Sets, No. 30 ..... ₱ doz., net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₱ doz ..... $1.50 } 50%
Mounted Kitchen Sand Stone, ₱ doz ..... $1.50 } 50%
Natural Grit Carving Knife Hones, ₱ doz ..... $3.00 } 50%
Quick Cut Emery Carving Knife Hones, ₱ doz ..... $1.50 } 50%
Quick Edge Pocket Knife Hones, ₱ doz ..... $2.50 } 50%

Skate—

Smith & Hemenway Co., Eureka 50%

Shaves, Spoke—

Iron ..... doz. $1.25
Wood ..... doz. $2.00
Bailey's (Stanley R. & L. Co.) 45%
Chapin-Stephens Co ..... 30@30&10%
Goodell's, ₱ doz, $9.00 ..... 15&10%

Shears—

Cast Iron	7	8	9 in.
Best	$16.00	18.00	20.00 gro.
Good	$13.00	15.00	17.00 gro.
Cheap	$5.00	6.00	7.00 gro.

Straight Trimmers, &c.:
Best quality Jap ..... 70@70&10%
Best quality Nickel ..... 60@60&10%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40@40&5%
Heinisch's Tailor's Shears 10%
National Cutlery Co.'s Nickel Plated, 60&10%; Japan Handles ..... 70&10%
Wilkinson Shear & Cutlery Co.:
Sheep, 1900 list ..... 30&10&5%
Grass ..... 50&10%
Horse or Mule ..... 50&10%
J. Wiss & Sons Co.:
Best Quality Jap'd ..... 60&10%
Best Quality Nickeled ..... 50&10%
Tailors' 25%

Tinners' Snips—

Steel Blades ..... 20@5@20&10%
Steel Laid Blades ..... 40&10@50%
Forged Handles, Steel Blades, Berlin 50%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s 6½ to 10 in ..... 33⅓&7½%
National Cutlery Co.'s Forged Steel 50%
Niagara Snips 40%
P., S. & W. Forged Handles, 25%; W. R. W ..... 40&10%
J. Wiss & Sons Co.:
Wiss Forged Steel 25%

Pruning Shears—

Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz, $18.00 ..... 25%
Disston's Pruning Hook only, ₱ doz., $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
P., S. & W. Co ..... 40&10%
Columbian Cutlery Co.:
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand, 60&10%

Sheaves—Sliding Door—

Reading 40%
R. & E. list 15%

Sliding Shutter—

Reading list 40%
R. & E. list 10%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge ..... 6%&10%
Club, Rival, 65&5%; First Quality, 6%&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, 25&5%
Union League, 12 and 12 gauge; Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20&5%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade 20%

Shells, Loaded—

Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40%
Nitro Club, Smokeless Powders ..... 40&5%
Arrow, Smokeless Powders ..... 40&10&10%
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Leader Grade ..... 40&10&10%
Black Powder 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:

	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:

Dixie, 14 x 20 in	$4.25	$5.50
Dixie, 10 x 14 in	4.50	6.00
Dixie, 7 x 10 in	5.00	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg. $4.10
Steel ..... per keg. $3.85
Burden's, all sizes ..... ₱ keg $3.90

Shot—

25-lb. bag.
Drop, up to B $1.80
Drop, B and larger 2.05
Buck 2.05
Chilled 2.05
Dust 2.30

Shovels and Spades—

Association List, Nov. 15, 1902 ..... 40%
Avery Stamping Co 40%

Snow Shovels—

Long Handle ..... $3.25@$3.50
Wood and Mall, D Handle, $3.75@$4.00

Sieves and Sifters—

Hunter's Imitation, gro $9.50
Hunter's Genuine, per gro $12.00

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each, $3.25; ₱ doz $39.00

Sieves, Seamless Metallic

Per dozen.

Mesh	1½	18	18	20
Iron Wire	$1.05	1.05	1.10	1.20
Tinned Wire	$1.15	1.15	1.20	1.30

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... doz. $0.90@0.95
Mesh 20, Nested ..... doz. $1.00@1.05
Mesh 24, Nested ..... doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:
12 x 12 to 22 x 36 in 60%
20 x 24 to 24 x 50 in 50%
24 x 60 to 24 x 120 in 30%
Barnes' low list:
Up to and including 20 x 36 in ..... 50&5%
20 x 40 to 24 x 50 in 45%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron ..... 70@75&10%
Steel ..... 40@45%

Slates, School—

Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless ..... 60&7 tens.
Victor A, Noiseless ..... 60&4 tens 45%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%
High Grade, 40%; Trojan 40%
Jockey 25%

Snaths—

Scythe 60%

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality ..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co:
1847 Rogers Bros., 40&10%; Rogers & Hamilton ..... 50&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60
Wm. Rogers & Son ..... 60&10%

Miscellaneous

German Silver ..... 60@60&5%

Tinned Iron—

Teas ..... per gro. 50@55¢
Tables ..... per gro. $0.90@$1.00

Springs— Door—

Bardsley's Spring and Check 40%
Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman Door and Gate 10%
Reliance (Coil) ..... 40&10%
Star (Coil) 30%
Torrey's Rod, 39 in ..... ₱ doz, $1.10

Carriage, Wagon, &c.—

1¼ in. and Wider: Per 100 lb.
Black ..... $1.75@$5.00
Half Bright ..... $1.75@$5.00
Bright ..... $5.25@$5.50
Painted Seat Springs:
1½ x 2 x 26 .... per pair. 45@47¢
1½ x 3 x 28 .... per pair. 68@71¢

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; National, ₱ doz $12.00
Enterprise ..... 25@30%
Philadelphia No. 1, ₱ doz, $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated ..... } List Jan. 5, 1900.
Steel and Iron ..... } 80@80&5%
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Squares and Bevels, Rosewood Handle, 60 & 10%; Iron Stock and Bevel 15%

Squeezers, Lemon

Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.00
Iron, Porcelain Lined ... doz. $1.75

Staples—

Barbed Blind ..... 85&5@85&10%
Electricians' ..... 80&10&10@85%
Fence Staples, Polished, $2.05; Galvanized $2.35
Poultry Netting Staples ..... per lb. 3¼@3½¢

Steels, Butchers'—

Dick's 30%
Foster Bros.' 30%

Steelyards— .... 30@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock 25%
Derby Screw Plates 25%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plate 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones—Oil, &c.

Pike Mfg. Co., 1907 list:	₱ lb.	
Arkansas St. No. 1, 3 to 5½ in.	$2.80	33⅓%
Arkansas St. No. 1, 5½ to 8 in.	$3.50	33⅓%
Arkansas Slips No. 1	$4.00	33⅓%
Lily White Washita, 4 to 8 in.	60¢	33⅓%
Rosy Red Washita, 4 to 8 in.	60¢	33⅓%
Washita St., Extra, 4 to 8 in.	50¢	33⅓%
Washita St., No. 1, 4 to 8 in.	40¢	33⅓%
Washita St., No. 2, 4 to 8 in.	25¢	33⅓%
Lily White Slips	90¢	33⅓%
Rosy Red Slips	90¢	33⅓%
Washita Slips, Extra	80¢	33⅓%
Washita Slips, No. 1	70¢	33⅓%
Washita Slips, No. 2	40¢	33⅓%
India Oil Stones (entire list)		33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit		40%
Quickcut Emery and Corundum Axe Stone, Double Grit		33⅓%
Quickcut Emery Rubbing Bricks		40%
Hindostan No. 1, R'g'lar	₱ lb 8¢	33⅓%
Hindostan No. 1, Small	₱ lb 10¢	33⅓%
Axe Stones (all kinds)		33⅓%
Turkey Oil Stones, Extra, 5 to 9 in.	₱ lb 80¢	33⅓%
Queer Creek Stones, 4 to 8 in.	20¢	33⅓%
Queer Creek Slips	10¢	33⅓%
Sand Stone	6¢	33⅓%

Scythe Stones—

Pike Mfg. Co., 1901 list:
Black Diamond S. S. ℔ gro. $12.00
Lamoille S. S. ℔ gro. $11.00
White Mountain S. S. ℔ gro. $9.50
Green Mountain S. S. ℔ gro. $7.00
Extra Indian Pond S. S. ℔ gro. $8.00
No. 1 Indian Pond S. S. ℔ gro. $7.50
No. 2 Indian Pond S. S. ℔ gro. $5.00
Leader Red End S. S. ℔ gro. $5.00
Quick Cut Emery ℔ gro. $10.00
Pure Corundum ℔ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat. $8.80
Emery Scythe Rifles, 3 Coat. $11.00
Emery Scythe Rifles, 4 Coat. $13.20
Balance of 1904 list 33⅓%.
Electro (Artificial), ℔ $12.00 gro., 33⅓%
Lightning (Artificial), ℔ $18.00 gro., 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers ℔ gro. $9.00

Stops— Bench—

Millers Falls 15&10%
Morrill's, ℔ doz., No. 1, $10.00 50%
Morrill's, No. 2, $12.50 50%

Door—

Chapin-Stephens Co. 50@50&10%

Plane—

Chapin-Stevens Co. 20%

Straps— Box—

Acme Embossed, case lots. 20&10&10%
Cary's Universal, case lots. 20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points . . doz. 55¢
All Steel Socket . . . doz. $2.00@2.25
Excelsior Stretcher and Tack Hammer Combined, ℔ doz., $6.00 20%

Stuffers, Sausage—

Enterprise Mfg. Co. 25@25&7½%
National Specialty Co., list Jan. 1, 1902 30&5%
P., S. & W. Co. 40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.: ℔ doz.
Superba, Crotch Mahogany $36.00
Triumph, Fancy Veneers $33.00
Parlor Queen, Fig. Rosewood $30.00
Elite, Hungarian Ash $29.00
Am. Queen, Fig. Mahogany $27.00
Ideal, Bird's-Eye Maple $25.00
Grand Rapids, Nickel, $24.00; Japan $22.00
Standard, Nickel, $22.00; Japan $20.00
Crown Jewel, Nickel, $21.00; Jap. $19.00
Crystal, Glass Top $36.00
Grand, 17 in. wide $36.00
Parlor Grand $48.00
Club, 24 in. wide $54.00
Hall 28 in. wide $60.00

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks . . . 90&40%
American Cut Tacks . . . . . 90&40%
Swedes' Cut Tacks . . . . . 90&40%
Swedes' Upholsterers' . . . . 90&50%
Gimp Tacks . . . . . 90&50%
Lace Tacks . . . . . 90&50%
Trimmers' Tacks . . . . . 90&40%
Looking Glass Tacks 65%
Bill Posters' and Railroad Tacks, 90&50&10%
Hungarian Nails . . . . . 80&20%
Finishing Nails 70%
Trunk and Clout Nails . . . 80&10%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks, 90&6 tens@—%
Se also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.: Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin . . . 50@—%
Patent Leather . . . . . 25@30&5%
Steel . . . . . 33⅓&5%
Chesterman's . . . . . 25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin 40&10@50%
Favorite, Duck and Leather 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkins:
Asses' Skin 40&10@50%
Metallic 30@30&5%
Patent Bend, Leather . . . 25&5@25&10%
Pocket 40@40&5%
Steel 33⅓@35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L, etc. 25%
Chesterman's Steel, No. 1038L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger, per 100 lb. . . . . $2.55@$2.80

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c. . . . . 30@35%

Ties, Bale—Steel Wire—

Single Loop . . . . . 82½&10%
Monitor, Cross Head, &c. 70&2½%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White 20@20&5%

Haying—

Myers' Hay Tools 45%

Ice Tools—

Gifford-Wood Co. 15%

Miniature—

Smith & Hemenway Co.'s, Davidson, ℔ doz., Nickel Plated, $1.50; Gold Plated $2.00

Saw—

Atkins' Cross Cut Saw Tools . . . 35&5%
Simond's Improved 33⅓%
Simonds' Crescent 25%

Ship—

L. & I. J. White 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz., $1.15@$1.25; gro. . . . . $11.50@12.00
Harper, Champion or Paragon, doz., $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida . . . . . 75@10%
Newhouse 45@45&5%
Hawley & Norton 65%
Victor 75@75&10%
Oneida Community Jump 50%
Hector 75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes, 12¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ℔ doz., $13.25 . . $11.50 doz.
No. 3, Rat, ℔ doz., $6.50 . . . $5.75 doz.
No. 3½, Rat, ℔ doz., $5.25 . . $4.70 doz.
No. 4, Mouse, ℔ doz., $3.85 . . $3.00 doz.
No. 5, Mouse, ℔ doz., $3.00 . . $2.25 doz.
Oneida Community:
Out o' Sight, Mouse, ℔ doz. $0.60
Out o' Sight, Rat, ℔ doz. 1.25
Easy Set, Mouse, ℔ doz. 35
Easy Set, Rat, ℔ doz. 1.00
Wood Choker, Rat, ℔ doz. holes. .12
Premier Tin Choker, 5 hole, ℔ doz. traps 75

Trowels—

Disston Brick and Pointing 25%
Disston Plastering 20%
Disston "Standard Brand" and Garden Trowels 30%
Kohler's Steel Garden Trowels, ℔ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels.. ℔ gro. $6.00
Woodrough & McParlin, Plastering 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern 50&10%
Western Pattern 60&10%
Handy Trucks ℔ doz. $16.00
Grocery ℔ doz $15.00
McKinney Trucks . . . . . each, net $10.00
Model Stove Trucks . . . . . ℔ doz $18.50

Tubs, Wash—

M'f'gr's list, price per gross.
No. 0 1 2 3
Galvanized . $67 $79 $89 $99 10&7½ d5&5%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls . 21@23¢
No. 12, ¼ and ½-lb. Balls . 19@21¢
No. 18, ¼ and ½-lb. Balls . 16@18¢
No. 24, ¼ and ½ -lb. Balls. 15½@17½¢
No. 36, ¼ and ½-lb. Balls . 15@17¢
Chalk Line, Cotton ¼-lb. Balls . . . . . 24@29¢
Cotton Mops, 6, 9, 12 and 15 lb to doz. . . . . 8½@19¢
Cotton Wrapping, 5 Balls to lb according to quality . . 13½@19¢
American 2-Ply Hemp, ¼ and ½-lb. Balls . . . . . 12½@15¢
American 3-Ply Hemp, 1-lb Balls . . . . . 13½@16¢
India 2-Ply Hemp, ¼ and ½-lb Balls (Spring Twine) . . 7½@9¢
India 3-Ply Hemp, 1-lb. Balls 7¼@9¢
India 2-Ply Hemp, 1½-lb. Balls. 7@8½¢
2, 3, 4 and 5-Ply Jute, 1½-lb. Balls . . . . . 9@11¢
Mason Line, Linen, ½-lb. Bls. 17¢
No. 26½ Mattress, ¼ and ½ lb. Balls, according to quality. 30@60¢
Wool, 2 to 6 ply . . . . B 6¢; A 7½¢

Vises—

Solid Box . . . . . 50&5@50&10&5%

Parallel—

Athol Machine Co.:
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co. 40%
Fisher & Norris Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00, 40%
Fulton Mach. & Vise Co.:
Reed, Swivel 25%
Star, Solid Jaw 40%
Hollands':
Machinists' 40@40&5%
Keystone 65&5@70%
Lewis Tool Co.:
Adjustable Jaw 30%
Monarch, 50%; Solid Jaw 50%
Massey Vise Co.:
Clincher 40%
Perfect, 15%; Lightning Grip 15%
Merrill's 20%
Millers Falls Oval Slide Pattern. 60&10%
Parker's:
Victor, 20@25%; Regulars . . 20@25%
Vulcan's 40@45%
Combination Pipe 55@60%
Prentiss 20@25%
Rock Island 25%
Snediker's X. L. 33⅓%
Stephens' 33⅓%

Saw Filers

Disston's D 3 Clamp and Guide, ℔ doz., $24.00, 30%; Clamps 30%
Perfection Saw Clamps, ℔ doz. . . . $4.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed 25%
Star 40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect . . . 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe . . 60@60&5%
Massey's Quick Action Pipe 40%
Parker's Combination Pipe: 87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.
Rock Island Pipe 25%

Wads—*Price per M.*

B. E., 11 up . . . . . 60¢
B. E., 9 and 10 . . . . . 70¢
B. E., 8 . . . . . 80¢
B. E., 7 . . . . . 80¢
P. E., 11 up $1.00
P. E., 9 and 10 . . . . . 1.25
P. E., 8 . . . . . 1.50
P. E., 7 . . . . . 1.50
Ely's B. E., 11 and larger . $1.70@1.75
Ely's P. E., 12 to 20 . . . . $3.00@3.25

Dis. 15%

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled . . . . . 45&10%
Ground . . . . . 50&5%
Plain or Unground 60%
Country Hollow Ware, per 100 lbs . . . . . $2.75@$3.00
White Enameled Ware:
Maslin Kettles . . . . . 65&10%
Covered Wares:
Tinned and Turned . . . . . 35&10%
Enameled . . . . . 45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware 33⅓%
Iron Clad Ware 70&10%
Lava and Volcanic, Enameled . . 40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	*6*	*7*	*8*	*9*
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles . . 65@65&5%
Avery Kettles 60%
Porcelained 50&5@50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles 60%
Solid Steel Spiders and Griddles. 65&5%
Solid Steel Kettles 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone . . . . 40@40&10%

Washboards—

Solid Zinc: ℔ doz.
Crescent, family size, bent frame. $4.05
Red Star, family size, stationary protector $4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector, $3.55
Cable Cross, family size, stationary protector $3 60
Single Zinc Surface:
Naiad, family size, open back, perforated $3.00
Single Saginaw Globe $2.85
Brass Surface:
Brass King, Single Surface, open back $4.05
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.60
Glass Surface:
Glass King, Single Surface, open back $3.95
Enamel Surface:
Enamel King, Single Surface, ventilated back $3.95

Washers—Leather, Axle—

Solid . . . . . 90@90&10%
Patent . . . . . 90@90&5%
Coil: ⅞ 1 1¼ 1¼ inch.
9¢ 10¢ 11¢ 14¢ per box.

Iron or Steel—

Size bolt . . . . 5-16 ⅜ ½ ⅝ ¾
Washers $1.65 3.75 2.45 2.25 2.05
The above prices are based on $6.75 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½-inch, barrel lots, per lb. 1½@1¾¢

Wedges—

Oil Finish . . . . . lb., 2¼@2¾¢

Weights—Hitching—

Covert Mfg. Co. 30&2%

Sash—

Per net ton, f.o.b. factory:
Eastern District . . . . $21.00@—
Western and Central Districts . . . . . $20.00@$22.00

Wheels, Well—

8-in., $2.00; 10-in., $2.30; 12-in., $3.00; 14-in., $4.45.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 . . . . . 72¢10¢7½%
10 to 18 . . . . . 72½¢10¢10%
19 to 26 . . . . . 75¢10¢10¢2½%
27 to 36 . . . . . 77½¢7½%
Galvanized:
6 to 9 . . . . . 72½¢10%
10 to 14 . . . . . 72½¢10¢5%
15 to 16 . . . . . 72½¢10¢5%
17 to 18 . . . . . 72½%
19 to 26 . . . . . 70¢5¢2½%
27 to 36 . . . . . 65¢10¢10%
Coppered:
6 to 9 . . . . . 65¢10¢10%
10 to 14 . . . . . 70¢10¢5%
15 to 18 . . . . . 65¢10¢10¢10%
19 to 26 . . . . . 70¢5¢2½%
27 to 36 . . . . . 72½¢10¢2½%
Tinned:
6 to 18 . . . . . 67¢10¢10%
Brass . . . . . 15½¢ lb., base
Copper . . . . . 15¢ lb., base
Cast Steel Wire 50%

Spooled Wire—

Annealed and Tinned 75%
Brass and Copper 70%
Retailers' Assortments, per box, $2.00@$2.25
Wire Clothes Line, See Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods . . . . . 90&40%
Brass Wire Goods . . . . . 90&40%
Brass Cup and Shoulder Hooks, 85&10%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80¢2½@80¢7½%
Painted Screen Cloth, 100 ft., $1.35
Standard Galv. Hardware Grade: 100 ft. rolls, 2½ to 48 in. wide, Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh $2.75
Nos. 4 and 5 Mesh $3.00
No. 6 Mesh $3.25
Nos. 7 and 8 Mesh $3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural . . . . . 80¢10&10%
Alligator or Crocodile . . 70¢10@75%
Baxter Pattern S Wrenches . . . 70¢5@70¢10%
Drop Forged S . . . . . 45@45¢5%
Acme 60&10%
Alligator Pattern, 70%; Bull Dog . . 70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut 50%
Combination Black 40&5%
Merrick Pattern 50%
Boardman's 40%
Coes' Genuine Knife Hdl. . 40&10&5&5%
Coes' Genuine Steel Hdl. . 40&10&5&5%
Coes' Genuine Key Model . 40&10&5&5%
Coes' Genuine Hammer Handle . . . . . 40&10&5&5%
Coes' "Mechanics'" . . . 40&10&10&5&5%
Donohue's Engineer 40&10%
Eagle 70%
Gem Pocket 30%
Hercules 70%
W. & B. Machinist:
Case lots 50&5%
Less than case lots 50%
W. & B. Railroad Special:
Case lots 50%
Less than case lots 40&10&5%
Solid Handles, P., S. & W. . 50&10%; full cases 50&10&5%
Standard Nipple Mfg. Co.:
Duplex Chain 50%
Stillson 65%
Uwanta Wrench Co.:
Uwanta Special, Iron Handle . . . . 40&10&5%
Other Wrenches 50%
Vulcan and Agrippa Chain 50%
Whitaker Machinists':
Case Lots 50&10%
Less than case lots 50%

Fruit Jar—

Benj. P. Forbes, Triumph, ℔ gro., $7.50; per doz. $0.90

Wrought Goods—

Staples, Hooks, &c., list March 17, '02 . . . . . 90@—%

Zinc—*(Cask lots at mill.)*

Sheet . . . . . per 100 lb., $7.00

For the Table of "Current Metal Prices" see the First Issue of Every Month.